THE

SOUTHERN AGRICULTURIST.

JANUARY, 1835.

PART I.

ORIGINAL COMMUNICATIONS.

Historical Sketch of Gardens.

To the Editor of the Southern Agriculturist.

If, in your opinion, the following historical sketch of the antiquity of Gardens will afford any amusement to your readers, it is at your service, and may hereafter be continued.

The first account of a garden we meet with, is in the Bible, and is coeval with the formation of man; we read in the ii. Gen. 7, 8, v. "and the Lord God formed man of the dust of the ground, and breathed into his nostrils the breath of life: and man became a living soul."—"And the Lord God planted a *garden* eastward in Eden: and there he put the man whom he had formed."—"And the Lord God took the man, and put him in the Garden of Eden to *dress it*, and to *keep it*."

From the foregoing passages of scripture, we learn, that *gardening*, was the first occupation of man, and that it was selected for him by his Maker; we also learn that the natural state of creation, may be improved by the hand of man, with the permission of the Almighty. Man although immortal, was not to be idle, he was to employ his time, in the pleasant occupation of *dressing* and *keeping* the garden. We cannot presume that man until his fall, experienced that kind of fatigue from labour, which produces sweat from exhaustion, for the iii. chap. 19 v.

as a punishment passes this sentence on him—"In the sweat of thy face shalt thou eat bread, till thou return unto the ground." Reader, does not this sentence intrude into your thoughts, whilst enjoying a walk in your garden, and in some measure alloy your pleasure?

After the destruction of the world by the flood, we find that Noah immediately became a husbandman, and planted a vineyard; and having, in all likelihood, obtained the knowledge of making wine, before the flood, (as intemperance was, no doubt, among the vices of the Antideluvians.) He made wine, and like Adam, abused the good gifts of his Maker. Noah drank too much wine, and was drunken, which was the cause of more sin in his family, for had he not been drunk, Ham would not have been guilty of disrespect to his father, which entailed a curse upon his posterity.

From this period, we find, that the cultivation of the earth, constituted the principal occupation of man; and was the great promoter and encouragement of all other employments and inventions.

The researches of Sir William Temple, on gardening, has been so great, that I shall take the liberty of making copious extracts, for those who may not be able to obtain his works. "He informs us that Epicurus was the first who had a garden in Athens, in which he passed his life; therein he studied, he exercised and taught philosophy; and, indeed, no other sort of abode seems so much to contribute to both tranquillity of mind, and indolence of body, which, he made his chief ends. The sweetness of air, the pleasantness of smells, the verdure of plants, the cleaness and lightness of food, the exercise of working or walking, but above all, the exemption from care and solicitude, seem equally to favour and improve, both contemplation and health, the enjoyment of sense and imagination, and thereby the quiet and ease both of body and mind."

Gardens, seem to have been the most ancient and most general of any sort of professions among mankind, and to have preceded those of corn or of cattle, as yielding the easier, the pleasanter, and more natural food; as it has been the inclination of kings, and the choice of philosophers, so it has been the common favourite of public and private men; a pleasure of the greatest, and the care of the meanest; an employment, for which no man is too

high, nor too low. If we believe scripture, we must allow that God Almighty esteemed the life of man in a garden the happiest he could give him, or else he would not have placed Adam in Eden; that it was the state of innocence and pleasure, and that the life of husbandry, and cities, came in after the fall, with guilt and labour.

Semiramis is said to be the first who brought them into use through her empire, from Babylon as far as India; the Assyrian Kings continued the custom, and one of them introduced the smaller or regular garden, for it is related of him, that having married a wife he was fond of, out of one of the provinces, where *Paradises* or gardens were much in use, and the air and confinement of the palace, or (seraglio) not agreeing with the country lady, he made her gardens not only within the palaces, but upon terraces raised with earth, over the arched roofs, and even upon the highest tower, and planted them with all kind of trees and flowers, and thereby made, at least, a most airy garden, as well as the most costly that have been heard of in the world.

The next gardens we read of are those of Solomon, planted with all sorts of fruit trees, and watered with fountains; it will be recollected that Solomon, wrote of all plants from the cedar to the shrub.

The celebrated gardens of the Hesperides are mentioned in history, but no certainty as to their location; it is presumed they were in Spain, and the fable of the tree which produced golden apples, was the orange; it is said that the Phœnecians, who were the earliest navigators, traded with Spain, which trade was very lucrative; the public sign exposed on the occasion, was a tree with golden fruit, to denote the riches arising from the commerce; a Dragon guarding the tree, signified the danger of the voyage; and the three months of winter in which they prepared for the expedition, were represented by three Nymphs, who were proprietors of the golden fruit, and had the name of Hesperides.

Very little mention is made of gardens in old Greece or old Rome, they appear to have been contented with their native productions, the vine, olive, fig, pear and apple; their gardens were a necessary part of their farms, intended for the produce of cheap food for their slaves, and therefore attended to the common sorts of plants, herbs and legumes, proper for common nourishment:

and the name of Hortus, is taken to be from Ortus, because it perpetually furnishes some use or production of something new in the world."

W. X.

Agricultural Labourers.

To the Editor of the Southern Agriculturist.

THE state of dependence of the great body of this class in the Southern States, we have always considered a decided advantage to them. Formed as it is of an inferior caste, in a state of society in which it stands connected with men of European origin, its condition must be unchangeably inferior and subordinate, and a condition in which it derives protection from the superior, the best for it. This truth should be held as settled with us, as the establishment of castes has been from time immemorial in the East-Indies. If this startles the philanthropy of any one, and the question is suggested—is then the condition of the slaves of this caste, never to be mitigated? We answer, that such mitigation is to be looked for only in the improvement of their masters. That it has already derived much amelioration from this source is the sure harbinger of its future improvement. Children, in this section of the Union, should be educated with a reference to this relation of masters and slaves. No terms of familiarity should ever be permitted between them, while at the same time, they should be taught that it is their duty, to regard them with benevolence, to administer to their wants, and to protect them from injury. Every effort should be used to prevent that sexual intercourse, which degrades the master and is the cause of discontent to the slave. As far as is practical, it would be advisable to have elderly servants only in families, and the young should be employed wholly in agrestic and other manual labours. The custom of bringing up negro children in towns or about the dwellings of their owners, is fraught with evil, and should be avoided. The master, reared with this salutary sense of superiority, will feel his place to be one connected with important duties to his God and his country. To his God, as having the charge of dependants who look to him for food, raiment and shelter, and who may be considered of his own family; and the scriptures

say, 'he is worse than a heathan who provideth not for his own household—with them his charity will begin at home—to his country, that his slaves should be taught subordination and good conduct, that peace and tranquillity may repose in the land, and in this way all that scrutiny of a minute police so harrassing to the poor of other countries, be unnecessary and altogether avoided. These duties being fulfilled, we might proudly ask what body of labourers in the world would be in so safe and comfortable a condition? And yet, some recent travellers and their reviewers, have inferred, from this state existing among us, that we should not be ranked with civilized nations, as if slavery were inconsistent with the highest refinement—so far from it, history authorizes us to assert, that it is favourable to the utmost polish. No nations have exceeded the Greeks and Romans, of antiquity, in this respect. Their advance in those arts, especially which mark the most improved state, leave us in despair of ever equaling them; and the relics of their poetry, paintings, sculpture and architecture, continue to excite undiminished admiration.

I have been led into this train of reflections, Mr. Editor, by the perusal of the observations which are annexed. They are from the late work of a Prussian, which although frivolous in many parts, contain some useful and interesting information. The volume is called Tutti Frutti, and is by Prince Puckler Muskau.

Serfs in Russia.—"On the whole, the situation of our peasants was infinitely preferable to that of the majority of small English farmers. Like them they farmed the land, but in lieu of rent surrendered to the landlord apart of the products, and dedicated to his services a portion of their time."

"This mode of payment was productive of great benefit to the farmer: but since the redemption of the services of the serfs to the proprietors, the effects are but too apparent in all poor countries. During the existence of the old system, the proprietor in most cases, would gladly have commuted services for money, even at half the usual rate of labour; however, this wish in this respect remained ungratified, owing to this, that the peasant seldom performed the work himself, but sent a child or servant as

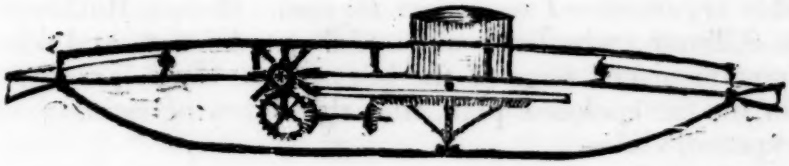
a substitute, in order that it might be executed as cheap as possible."

"What then were the conditions the proprietor had himself to perform? He gave wood for burning, straw, forest-hay, kept the dwelling in repair, rebuilt it if destroyed by fire, or any other accident, and besides this he had to replace the lost materials, furniture, &c." He then asks, "if this can be considered slavery more than any other situation requiring personal services to be rendered." And continues, "Slavery in my opinion consists in a man being forced to labour without any recompense. This was by no means the case with our peasants, since the abrogation of hereditary servitude." He then says, "That state was mutually advantageous. The great embarrassment attending the liberation of the serfs, has arisen from the numerous officers necessary to adjust contracts between them and their masters." (Mark this.)

In conclusion, he says—"My opinion of the subject is, that peasants are reduced to a still lower grade than they were before, and their masters have nearly sunk to the level of their former serfs. Unfortunately the poor are every where slaves, even in the midst of the most advanced state of civilization and liberal institutions; and the most enthusiastic admirers of the unlimited independence of the peasants, whose views I entirely coincide with and wish to see adopted, where it can be done without endangering the rights and interests of those more immediately interested, must agree with me in lamenting the unhappy results which have ensued."

Remarks.—The liberation of a white population from servitude, we have always considered free from all objections, and as an event which will always occur in the progress of society to civilization. Yet even such a change cannot be made without great danger and distress.—When the slaves are black, it is not saying too much to assert, that the civilization of the society in which they amalgamate would be overturned, and that it would lose its rank and caste among civilized nations.

A READER.



Proposed Plan, and estimate of cost, of a Ferry-Boat, suitable for Southern Rivers, with a Representation, by way of Explanation.

To the Editor of the Southern Agriculturist.

Dear Sir,—I send you, according to promise, a communication from a friend in New-York, on the subject of the Ferry-boats in use on the Hudson, at Albany and Troy; and which he supposes to be peculiarly adapted to our Southern rivers. The plan and estimate are furnished by Messrs. Rathbone & Silliman of Albany.

I am, &c., very respectfully,

P. C. GRIMBALL.

John's Island, November 15, 1834.

"*My Dear Sir*,—I venture to renew the old topic of conversation, which often occupied us when I was in Carolina, but only, however, to offer to your Committee a plan of a ferry-boat, which I had proposed as suitable to our purpose. I confess, I was so much mortified at the opposition which my project encountered from those persons, who, it seemed to me, should have been most interested in its success, that I have procured the inclosed plan and estimate, not so much from the hope that it might be useful to us, as to offer to the charitable constructions of my neighbours an apology for my "visionary schemes." I must say, however, that I sincerely desire to be useful, even in smaller matters, and I think any one would do the State service who would promote the introduction of such improvements.

You, who have often travelled at the North, will rocognize the face of an old friend in this new picture, and it will recur to you how remarkable it seemed at the time you may have crossed the Hudson, at Albany, or at Troy, on your way to the Springs, that a machine so commonly useful, and yet so simple, should be quite unknown on Southern rivers, for which it is so admirably adapted.

I must be wise, however, and begin with the unanswerable argument—*I must count the cost.* Messrs. Rathbone & Silliman, who have a foundary at Albany, and who have furnished some of the last of these boats, prepared for me the enclosed plan, and the following estimate of expense, viz:—

Castings, wrought iron and brass work, -	$450
Wood work, and putting together machinery,	200
Flat boat to put the machinery in, - -	600
Total, - -	$1250

The whole affair consists of a flat about fifty feet long, which is decked over, and has guard rails on each side like a bridge. The horses or mules are placed outside this guard-rail, on a projection of the great horizontal wheel. Their traces are attached to a fixture on the deck, and when the animals are started, the wheel is driven round under their feet in the effort to advance, and communicates the power to the paddle-wheels, as you will readily understand from the plan. Over the stations of the animals used to work the boat, there is a covered stall, in which they may be always kept and fed on the spot when employed, and always protected from the weather.

The current at Albany is sometimes three miles in the hour, and often rough, yet the boat will cross in three minutes. The advantages of this boat are the substitution of animal for human labour, and the superior safety, convenience and expedition with which the work may be accomplished.

The services of a white man are required to superintend every ferry, at the South, by law, and since no hard labour is requisite, the ferry master, with a boy to drive the horses, would be all the personal attendance necessary. In short, it seems to me, that two prime hands employed at this business, with the usual material of flat, oars, &c. would cost, at least, as much as the proposed horse-boat, and would be on the score of security, a cost of property requiring a much higher premium than the other. It would not be as good as the horse-ferry boat therefore, if the encouragement should be at the *lowest* point that could sustain either; but on the other hand, as the encouragement becomes greater, the advan-

tage both on the ground of economy and convenience, would admit of no comparison.

The boat here proposed will carry two or three carriages and horses, being fifty feet long, but that might be made smaller if required. Yet, perhaps, this length would furnish the best proportion, and should on many accounts be preferred.

I understand that the patent right from being often improved upon, has been lost or abandoned, yet it would be better for us, if we were permitted to have such a boat, to get the machinery with the wood work of Messrs. Rathbone and Silliman, and have the flat built in Charleston.

A SUBSCRIBER.

New-York, October 3d, 1834.

On the Rot in Cotton, and the introduction of the Petit Gulf Seed from New-Orleans as a remedy.

Edgefield District, (S. C.) near Mount Vintage P. O.
December 14, 1834.

To the Editor of the Southern Agriculturist.

Sir,—I shall endeavour to throw some light on the rot in cotton, and recommend the more general introduction of a better species, than our common green seed.

The last year I purchased in Augusta a bag, containing about six bushels of what is termed Petit Gulf Cotton Seed, and with it planted about ten acres of land; this cotton did not suffer from rot, whilst a fourth, at least, of the balance of my other cotton crop was lost by it. With the seed produced from these ten acres of cotton, I planted seventy acres the present year, and had enough left to replant a supply if occasion should have required it.

The general and fatal effects of the rot the present year, is so well known, that it is unnecessary to enter into a detailed account of it. My cotton was so much exempt from it, that I thought it unnecessary to make any calculation of loss from it, whilst that of my neighbours all around was destroyed in a ratio of from one-fourth to a third of their crops; and although the frost of the 20th October, was so severe as to destroy all vegetation, my cotton book will show five thousand weight of seed cotton picked in, to every effective hand, and in this section of impoverished country, may be considered a good crop, even if no accident had occurred; and this I ascribe to

the Petit Gulf seed. I would, therefore, advise every planter of cotton, to procure this seed from New-Orleans, let it cost what it will, at least as much as will put him in seed for the next year, and to adopt the same plan every second or third year at farthest, for after that period it will become degenerated by mixture, and then more subject to the evil of which we complain. Perhaps by the general introduction of this seed the enemy may, by the change of food, be driven off entirely, as I am perfectly satisfied, that the rot originates from insects, and we know that every insect has a predilection for a certain kind of food, and this species of cotton is less palatable to them than the common green seed. I am the more convinced of this fact, from having tried a small experiment two years in succession, of some black seed from Peru, to acclimatize it, but found the seasons too short, to make it an object. This cotton was not affected by the rot, whilst other cotton near it was—and if I am not mistaken, the sea island cotton is exempt from this kind of rot.

On a former occasion I have advanced this opinion in relation to insects, and every day's experience confirms me in it. These insects are like some of the human family, (a kind of thieving tribe) that seldom appear until the sun declines and "the evening shades" prevail, and then come from their concealments to commit their depredations, until he returns to throw his light upon the earth, when they retire to their covert beyond discovery.

The reason why the cotton boles are more subject to the rot in rainy seasons, or when the atmosphere is humid, is owing to a promotion of growth in the plant, making them more tender and susceptible of perforation than in dry seasons, rendering the insect more industrious in taking his food, and leaving the injury behind him. It is always observed after a shower of rain, that insects are more upon the alert in gathering food, and sipping from the breath of Flora the refreshment produced by it, than in a time of drought.

In conclusion, I would further remark, the Petit Gulf cotton, grows more luxuriantly, the quality is better and one-third more can be picked out in the same time than the green seed; and the return is thirty pounds of net cotton to one hundred of that in seed.

A PRACTICAL PLANTER.

On the method of fattening Calves and Lambs for Market.

To the Editor of the Southern Agriculturist.

THE manner of procuring Lamb and Veal of a very fat and superior quality, as practised in England, and partially by graziers for the Philadelphia market, does not seem to be noticed in works on agriculture, in a manner worthy of the subject. With a view of impressing the importance of it upon the minds of our planters and farmers, both in reference to the profit to be derived to themselves from it, as well as the improvement of our market, which ought to be a consideration with every public spirited farmer, we shall give such details furnished to us in a conversation with a gentleman of some experience, and apparently well acquainted with the whole *rationale*, as will place the subject within the reach of every one.

All animals, in health, being high fed, and debarred from exercise, become fat—to this, in the human species, there are many exceptions; but these exceptions arise from the fact, that man as an intellectual being, is operated upon by the influence of his mind, and when that becomes disturbed, by the cares of life, his physical faculties, particularly those of his digestion, become impaired, and however high he may feed, and lazy his habits may be, food will appear to do nothing more than to sustain life, without increasing his bulk. With other animals such is not the case, their wants, limited to few, nature has bestowed upon them, in a few gifts, the ample means of supplying them, and hence, there are no circumstances, but injury, ill health, or mismanagement, that can prevent them from becoming fat when properly and highly fed, and suffered to remain in indolence.

From the mildness of our winters, and spare labour upon our plantations, there is no portion of this country that affords greater facilities, for the fattening of calves and lambs for our market than Carolina, and yet that market bears ample testimony of the gross and palpable negligence of those whose interests ought to excite them to exertion. Any one in the habit of buying his provisions, must remark the general inferiority of the veal and lamb brought to the Charleston market, we seldom see a piece of either above mediocrity, and that considered so rare,

that an enormous price is demanded, and frequently obtained for it. This would not be the case, were our planters and farmers to turn their attention to this subject, which by improving the quality, would increase the consumption, and consequently their profit, by a ready market for this portion of their stock.

The method pursued in other countries, and which can be so easily obtained in ours, is this:—the calves, shortly after they are dropt, and when they have obtained sufficient strength to run and skip about, are shut up in a very dry and clean pen, about nine or ten feet square, being of a size sufficient to contain six or nine calves. A small manger, sufficiently low to enable them to reach the food placed in it, must be fixed in the centre of the pen; in this manger their food, consisting of ground Indian corn, (not sifted) must be daily put, not more than they can consume; a small bundle of fine hay tied up, and a lump of chalk should be placed within their reach, the former for them to nibble at, the latter for them to lick. This occasions an increase of appetite in them for their mother's milk, and contributes vastly to the fattening of them; the confinement prevents them from interrupting the increase of fat by the exercise they would take in their playful gambols if let loose. The chalk also has a tendency to correct the acidity in their stomach, which frequently produces a looseness in their bowels very embarrasing to the process. The cows are kept in stalls separately, but not wholly confined, the calves are led to them every morning and evening, and having sucked their fill are replaced in their pens. The calves are thus taught to suck any of the cows; this, however, is not necessary when the cows are regularly fed, unless it is desired to have a calf of extraordinary size, by permitting it to suck longer than usual. The higher the cows are fed the better, therefore good hay, pumkins and steamed potatoes, should be furnished to them with an unsparing hand; the nourishment of the potatoes is much improved by mixing them with hay tea; and where it can be procurred flaxseed jelly; this being a scarce article in this section of the country, may, perhaps, be dispensed with, without any visible difference. In thus improving the quality and value of veal, the old stock becomes of importance, for the process in relation to the calves being effected in the course of from six to eight

weeks, the butter which the cows afterwards yield, is of a beautiful yellow colour, firm texture, and remarkably rich, this is the natural consequence of the feeding of the cows during the time of the fattening of the calves.

Those who pursue the process we have above detailed in order to make the veal white, in clear weather, bleed the calves in the neck every third day, until their eyes indicate an approach to faintiness; this must be done in the middle of the day. This animal appears to be peculiarly subject to plethora, therefore it should be moderately fed at first, and some blood taken from them whenever there appears in them a loss of appetite.

In fattening lambs, the ewes require considerable attention, they should be fed upon a rye-patch or turnip bed, or food of similar character. The lambs as fast as they are born and run alone, must be shut up in a dark stall, the size of which must correspond with the number of lambs to be attended to; a trough sufficiently low for them to eat from, must be placed in some convenient place within the stall, which must be supplied daily with Indian corn meal and bran; within their reach must be hung up a small wisp of fine hay. Adjoining this stall there must be a larger apartment, into which the ewes are to be turned two or three times a day to suckle the lambs, and must be permitted to remain with them all night. Early in the morning, and before the ewes are turned out to pasture, the lambs must be put in their dark stall, in order to debar them from exercise; and having no other amusement but that of the glutton, will nibble so much of the hay, and eat so much of the Indian corn meal as to make them excessively thirsty, by the time they are to be suckled by the ewes, which will make them grow extraordinary large and fat, in a short time.

There is considerable advantage derived from this mode of treatment in the lamb's indiscriminately sucking the ewes, without reference particularly to their own dams, because, when the lambs grow and gain strength, they are able to consume more milk, than can be afforded by a single ewe, particularly those that have more than one lamb. Another advantage derived, is when all the lambs of a ewe are killed off, she will continue to suckle the rest as before, thus giving additional nourishment to the surviving lambs.

The process above detailed, is so simple in its character, as to be within the reach of every one disposed to make the experiment; one that will insure both amusement and profit, and which may safely be confided (under the eye of the master,) to such negroes as could not do much in the field. Our Island planters have a favourable opportunity of stocking our markets with the finest small meats, almost without an exertion. The exhibition of our markets in the summer months, should display the finest specimens of these articles, yet there is scarcely a piece of meat of either of the above descriptions brought to market at that season, that may be compared with the inferior kinds of the North. This is a reflection upon a land like ours, abounding with luxuriant herbage and roots, and speaks a language not to be misunderstood, that there is a gross deficiency in the energy of our planters and farmers in this branch of their agricultural pursuits. S.

Charleston, Dec. 14, 1834.

On cultivating Rice Grass or Leersia oryzodes, for hay.

Charleston, December 24, 1834.

To the Editor of the Southern Agriculturist.

Dear Sir,—In compliance with your request that I would communicate the result of my experience in cultivating the "Rice Grass," or *Leersia oryzoides*, for hay, I must premise, that my acquaintance with this valuable production is recent and accidental. During a dry season in March 1832, an acre of land on my farm in Pendleton, which had been frequently planted in corn, (but was too low and moist to produce that grain successfully,) was lightly ploughed with a small bar-share, and then sowed with Herd's grass seed and rolled; the grass seed was injured and never came up, but a fine and tall native grass mixed with weeds, grew in the summer, and was mowed in the autumn. In the following summer a very luxuriant crop of the grass appeared without weeds, and the product of the first mowing in July was abundant, and put up in covered pens to be weighed for the premium offered by the Farmer's Society in Pendleton. These were placed on the border of the low lands above the usual level of freshes, but we had a fresh on the 11th of August of that

year, 1833, several feet higher than usual, and the pens were flowed two or three feet deep; it was necessary to remove the hay to dry, and being mixed with other parcels, prevented an offer for the premium. The product of the fall cutting was good, and I have continued to harvest two good crops of hay annually from the same meadow: this single acre, with about two others, similarly situated, affords as much hay as can be put up in an open log barn, 14 by 32 feet, and 10 feet high.

I believe that this "*Rice Grass*," called "*Nimble Will*," in the upper country, will grow in any low grounds that are cleared and ploughed, and too moist for corn. I have never sown the seed, but have not found it growing spontaneously in low lands that were dry enough to produce corn. It has a fine leaf with so small a stalk, that if the growth were not compact, it would be difficult to cut; this should be done before it blooms, as the stalks bend and impede the progress of the scythe. It is difficult to mow half an acre per day. It cures rapidly, and may be put up in large hay cocks the evening of the day it is cut, and after two or three hours sunning next morning, it may be put into the hay-house. In order to cure it to the greatest advantage, it is necessary to pursue the German method of tangling and tossing the grass with a hay-fork as soon as cut, this preserves the colour and flavour, and enables you to house it sooner than if the turning is postponed until the upper surface dries. The hay feels rough when drawn through the fingers, but experience has proved that cattle and horses are fond of it. This growth has a singular effect on the soil, differing from the usual result of cultivating hay on moist land: instead of becoming more firm it becomes less so; this might be obviated by draining, an experiment which should be cautiously made lest it impede or destroy the growth of the grass.

It is much to be desired, Mr. Editor, that our attention could be directed to the cultivation of hay more extensively. As a substitute for blades, it possesses many advantages; no argument on this subject approaches so near to demonstration as the fact, that in hay countries, corn blades are not used; the labour of stripping and curing exceeding the value. I have a neighbour who can fill a small barn adjoining his meadow with hay in four days, but cannot fill the same building with blades in double or treble that time. In countries, where hay and small

grain are cultivated, the lands improve in quality and value, but where corn and cotton are the staples, they drive the cultivator to the West, or to ruin.

These remarks apply to the rolling lands above the falls of the rivers: in a subsequent communication, I will endeavour to point out some of the causes of emigration from those once fertile regions.

Yours, respectfully,

C. C. PINCKNEY.

On the care necessary in the use of Guns with Percussion Locks.

Charleston, December, 1834.

To the Editor of the Southern Agriculturist.

Mr. Editor,—The abundance of game with which our country abounds, offers to the planter and gentleman of leisure recreation of the most delightful character, and hence it is that every planter, at least, in this section of the country, is a sportsman. Accustomed from infancy to hunt the deer, and bag his other game, it would be a rare sight to meet with one who is not a skilful rider and expert marksman; and thus it is, that we invariably meet at the country residence of every gentleman, a variety of fire-arms, particularly fowling-pieces, some very costly and highly finished.

Within a few years the flint and hammer lock has in a great measure yielded to the superior excellence of the percussion lock; one of the great defects of the former, was its liability from being used much, to leak the priming from the pan, and to admit moisture, rendering it extremely uncertain in wet weather, added to this the flash from the pan would always precede the report, and enable the game sometimes to escape, this in the new construction is entirely obviated, and although in this respect the advantage may not be perceptible, yet its existence may be assumed as a fact. In the old construction, the repeated attrition between the flint and hammer, producing prodigious heat, as is evidenced by the particles of steel scraped from the latter taking fire, and occasioning the sparks that ignite the priming, in time dimishes its temper, and renders its operations uncertain, or if this should not always happen, the necessity of frequently replacing the flint when perhaps none are at hand, all had a tendency

to embarrass and perplex the sportsman. It was, therefore, a great *desideratum*, that there should be some contrivance to render this part of the apparatus more simple and certain. Among the developements of chemistry, there was one that seemed to promise this, in the discovery of the several fulminating powders, but the preparation of these articles was attended with so much danger, that they have never been applied to any useful purpose, and are hidden from all, except those who may have the temerity to prepare them.

Upon the discovery that *Chlorate of Potassa*, formerly known as the *Hyperoxymuriate of Potass*, if mixed with inflammable substances would detonate, if struck with a hammer, it occurred to the Rev. Alexander Forsyth of Belhelaive, in Aberdeenshire, Scotland, that a detonating powder might be made from this salts, and by proper apparatus be applied to discharge fire-arms; the powder which he used was composed of this salt well incorporated with sulphur. A variety of expedients would suggest itself to apply this powder to the desired purpose. Forsyth took out a patent for a new kind of gun-lock to be used without a flint, which primed itself in the act of raising the cock. This priming was contained in the hollow cavity of a box moving upon a swivel, having an aperture corresponding with a small hole in the swivel, which formed a communication with the charge in the gun; when this box was turned up, a grain of the detonating powder would fill the hole in the swivel, when turned down, the communication between the priming in the magazine or box would be cut off, otherwise the whole would take fire, and a small steel punch passing through the end of the box in which there was no powder, was brought directly over the grain of powder in the hole made in the swivel; things being thus adjusted, the gun was fired in the usual way, the cock something in the form of a hammer, striking upon the small steel punch, would occasion a percussion between it and the grain of powder beneath it, and thus discharge the piece. Great defects were soon discovered in this apparatus; it was too complicated; from the corrosive nature of the *Chlorate of Potassa*, the apparatus would oxidate with great rapidity, rendering the whole in a short time dangerous and useless, for by the injury received in the joint formed by the

magazine turning upon the swivel, the fire would get access to the reserved priming and explode the whole. This plan was therefore abandoned. The next contrivance consisted in having a stationary block, with a hole in it, forming a communication with the touch-hole of the gun, in which the priming was put by the hand, after which a small steel plug was put in, which received the blow of the cock, and discharged the piece. This contrivance removed the great defect arising from the liability of the explosion of the priming, but the difficulty of keeping that part clean, that came in contact with the point of the punch, presented an obstacle, and evinced that something more was necessary to introduce this mode of firing guns into general practice.

The percussion cap appears to have furnished all that is desirable, and has thrown out of use entirely, all former contrivances on this subject. The construction and operation of this lock is now so well known, as to render any description unnecessary. I shall confine myself, therefore, to the only two cases, in which percussion locks are attended with danger, and *these cases can only arise from extreme negligence;* therefore, the most ordinary care, will, in every case, avert the danger arising from them. There are several means that give rise to accidents from flint guns. Sportsman returning from a hunt, are very apt to place their loaded guns in some corner of the house or passage way, within the reach of all who may choose to intermeddle with them, the danger arising from this custom is increased, if the sportsman be so careless as to leave it in that state cocked. It frequently happens that some companion or inmate will examine the gun, and without ascertaining if it be loaded or not, will attempt to snap it, but fire it off; this cannot take place with a percussion lock, for the presence of the cap will at once indicate the gun to be loaded. The lock of the flint gun gets frequently out of order, goes off at half cock, and may be fired off by a child. In the hands of a grown person, an attempt to pull the trigger at half cock frequently takes place, and the gun is discharged. Not so in the percussion lock; for when loaded, the cock is always down upon the cap, the pulling of the trigger, therefore, cannot operate upon it. Some, by way of caution, throw out the priming from their flint guns when

put aside, without regarding the probability of some grains of powder remaining in the pan; if under these circumstances, it be taken up by a companion, who deeming himself very cautious, throws up the hammer, find no priming in the pan, takes it for granted, that the gun is not loaded, snaps it, and ten chances to one the gun goes off; this cannot take place with a percussion gun, for no one ever snaps one of this description, as no sparks are emitted to compensate him for the experiment.

Having examined the comparative danger of the two species of guns above alluded to, I shall point out those attendant upon the percussion lock. It is well known that the detonating powder above described, is put in small copper caps, which are placed on a perforated nipple in front of the cock, upon the tumbler being detached from the dog by the trigger, the cock is brought down with great violence by a very strong spring upon the copper cap, which creating a percussion between the nipple and the face of the hammer, ignites the detonating powder between them and discharges the piece. A certain force is necessary to produce this result, and whether that be obtained by a blow from a hammer or the expansion of a spring, is immaterial, a certain *quantum* of force is necessary. Let us suppose that the spring of a percussion lock is capable of moving 20lbs. the *momentum* which forces the cock upon the copper cap, will be a trifle more than this, if the cock therefore is let down and remains upon the cap, the latter will be pressed down upon the nipple with a force equal to 20lbs. and will in that condition require *very little more force* to ignite the cap, and *this force is obtained by striking the butt of the stock upon the ground, in some cases even very gently*, for it must be recollected that the whole force of the spring is pressing upon the cap, and any additional force created by a jar or blow on the gun will discharge it; therefore a cautious sportsman will never strike the butt of his gun upon the ground, nor put it in a situation where it may fall down when it is capped, a *very* cautious sportsman will not place the cap upon the nipple until he is ready for immediate action. It is better, however, to remove the cap previous to putting aside the gun, and as a small portion of the powder from the cap may adhere to the point of the nipple, it would always be pro-

per to wipe it well, as an officious snapper, in his experiments, might, under the impression that the gun could not go off without a cap, discover that the small quantity left on the nipple is sufficient to create a great deal of alarm and mischief.

From what I have said it may be collected, that with ordinary care and precaution, the most absolute security against accidents is obtained from the use of the percussion lock, and that with ordinary negligence, it may be made the fruitful source of much distress and danger.

SCRIBERIUS.

Experiment in Planting the Cocoanut.

Fayetteville, (N. C.) October 8, 1834.

To the Editor of the Southern Agriculturist.

Dear Sir,—In the spring of 1833, I planted a *Cocoanut*, which came up in about four months, and grew in height 6 inches. I lost it during the winter by frost. Early this spring I examined the old root and found it alive, but it did not sprout; think I must have injured it. I then procured two others and planted them at an angle of 45°, eye down about 6 inches deep. About the 1st of September they came up, and now they are 18 inches high. I would thank you for your views of protecting them from the frost.

Yours, very respectfully,

A. W. HORTON.

Inquiry respecting Green Seed Cotton.

Robertsville, (S. C.) 1834.

To the Editor of the Southern Agriculturist.

Dear Sir,—Can you do me the favour to inform me where the Green Seed Cotton was obtained, when it was first brought into this country; and if so, whether it is likely any could be had at the present time. Your immediate attention to my request, will place me under obligations.

Yours, respectfully,

A SUBSCRIBER.

[We shall be obliged to any of our Correspondents, if they will reply to the above inquiry, as we are not in possession of the information ourselves.—*Ed.*]

PART II.

SELECTIONS.

Drainage of Soils.

The following is copied from the London "*Horticultural Register,*" and is an EXTRACT from a late publication, entitled "*The Practical Irrigator and Drainer;* by GEORGE STEPHENS, Land-Drainer, and Member of the Nerician and Warmlandska Agricultural Societies, Sweden, which has passed a 3d edition in England, and is pronounced the best work, on the subject it treats of, hitherto published—written in a plain sensible manner, containing the General Principles of Irrigation, Draining, Straightening Water-Courses, Protecting River Banks, Embanking Lands, &c. &c. Illustrated with Engravings; besides wood cuts illustrative of the plan of forming water meadows and draining, on Mr. Stephen's principle. But here follows the judicious manner in which he writes, and we hope it will be the means of giving much information to Planters, who have not yet considered the subject.

DRAINAGE OF SOILS, COMPOSED OF ALTERNATE BEDS OF CLAY AND SAND-RIDGES.

Soils composed of an intermixed variety, and when clay predominates, are attended with much greater difficulty in draining than those in which both the surface and internal strata are more regularly disposed. In such soils, where every reservoir of water is unconnected with one another, being separated by means of clay beds or dykes, the partial collections of water which they contain are so much augmented in rainy seasons, as to be filled to the level of the surface of the surrounding clay, which it overflows, and renders it so wet and sour, that all kinds of crops are stinted in their growth. As these sand ridges have no communication with each other, a separate drain is required from each in order to reduce the water in them. The outlet drain must be made from the lowest part of the field to the sand ridge, situated at the highest and most distant part, and to be carried in such a direction as to touch, if possible, some of the intermediate sand ridges, whereby a considerable extent of drain will be saved. From the outlet drain, branches must be carried to each of the sand ridges, which, when made sufficiently deep, will draw the water from them, and prevent it wetting the adjacent surface. Although the water oozes out all the way round the sand ridges, a sufficiently deep drain on the lower side will, in many cases, extract the water from both sides; but when the ridges are of considerable extent, and the sand of

a very fine quality, so as not to allow the water to pass through it freely, the drain must be continued all the way round.

In many cases, the whole of the wetness proceeds from the water in the upper sand ridge passing over the intermediate spaces of clay, and through the different ridges below. When this happens, the drainage of the whole field may be accomplished with much less difficulty than in the former instance. After the outlet drain has been made the upper drain must be cut, which will intercept the water, and may, by this means, render the lower drains unnecessary. It is evident from this, that the water breaking out of the sand ridge in the highest part of a field, may be the sole cause of injury to a considerable extent below; it is, therefore, expedient, in draining land of this description, that the water in the upper side of the field should be first cut off, and its effect ascertained before any more drains are made in the lower part.

There are other soils of a similar nature, the drainage of which is easier accomplished, on account of their alternate beds of clay and fine sand lying much more regular. Under the alternate beds of clay and fine sand, which are often almost parallel to one another, is generally found an impervious body of clay, which keeps the veins of sand full of water, moistening the adjacent clay, and running over it. As the main body of clay is seldom more than four or five feet below the surface, a drain must be cut to that depth through the middle of the field, if it has a descent from both sides; and if the ground declines all to one side, two drains will be required, the one near the upper side, to cut off the water coming from the ground above, and the other near the lower extremity or lowest part, where the water in the different beds of sand will easily discharge itself. This, no doubt, will answer the purpose effectually—as the drains cross the different beds that contain the water, they will draw it from each, unless the field is of considerable extent, or have more hollows than one, in which case a drain must be made through every hollow. In draining land of this kind, there is seldom any need for using the auger, as the necessary depth of the drains reaches the impervious body of clay, the thickness of which being so great, that any water that is confined below will do no injury to the crop.

Another description of land to which nearly the same treatment may be applied, is when the soil and sub-soil, to the depth of three or four feet, is entirely porous, having under that a strong body of retentive clay; the rain water falling on the surface subsides till it meets with the clay, and then being obstructed from farther descent, the whole mass of porous soil above is filled with stagnant water, which not only retards the operations of agriculture, but also vegetation. To remedy this, it requires only one or more drains, according to the situation of the field; and these require to be made no deeper than to reach a few inches into the clay, between which and the porous soil the greatest part of the water remains stagnant, although it does not appear on the surface. If the land has a small descent from both sides, a drain cut through the porous soil into the clay in the hollow will effectually draw off the water; but if the surface is undulating, as is often the case, it is necessary to make a drain winding through all the lowest places, and when it is almost level, or inclining to one side, the drains must be made across the slope, to some convenient outlet in the side of the field, taking care, in running them, to give as much fall as that the water will run without standing still in their bottom. A particular

account of the general dimensions and method of making drains adapted to such soils, will be found under the head of Rumbling Drains. Much land of the above description, in various districts of this country, may be completely drained in the same manner, at a very moderate expense, by a proper attention being paid to the situation of the ground, and cause of the wetness. Such land remains so long wet in spring before it can be sown, that the crop is either obliged to be cut green, or, in some instances, is lost altogether.

DRAINAGE OF CLAY-SOIL INJURED BY SURFACE WATER.

Owing to a considerable portion of the ploughable land in this country being injured by surface water, or water lodged between the soil and sub-soil, systems as various as the effects they produce, have of late been applied to drain such, and it therefore becomes a matter of the greatest importance that some definite rule be laid down, whereby a complete and permanent drainage may be effected in such land, and which at the same time, will be attended with the least expense.

Tenacious soils are much more expensive to drain than any other, as the drains must be more numerous, in consequence of having to be laid out in such a manner as to collect all the water from the surface, which, from the imperfect viability of the clay, must, in many cases, discharge itself into them from above; and where there is any irregularity on the ground, the water will remain standing in the hollows if a drain is not carried through each of them. Drains for removing surface water from such land, when it lies flat, should therefore go through the hollowest parts of the field, without any respect to straightness or regularity, and at such a distance from each other as will keep the surface of the land dry. When the soil and sub-soil are composed of strong clay, twenty feet between the drains may be fixed on as a general rule at which they will act; but when the clay is mixed with thin veins of very fine sand, which is very often the case, thirty feet will answer completely. When the ground, however, has the least declivity, the drains should always be directed obliquely across the slope, or as directly across it as the nature of the surface and outlet will allow; the distance of one drain from another, in this case, depends on the declivity, the preparation of sandy substance mixed with the clay, and the depth of the drain. Where the soil is very tenacious, and the declivity considerable, the drains will not act more than twenty or thirty feet; but where it is mixed with thin strata of fine sand, although the sand is hardly perceivable, the same depth of drain will act several times that distance. The necessary dimensions of drains for removing surface water is found, from experience, to be from two and a half, to three feet deep, sixteen inches wide at top, and twelve inches at bottom; and they should be filled with stones, broken to the size of road metal, in arable land, to within twelve inches of the surface of the ground; and in permanent pasture, such as lawn and pleasure ground, to within two or three inches of the surface of the ground. In all cases, after having covered the stones with some straw or turf, the remaining space should be filled with porous earth or sand, which, if it cannot be found near the drain, should be carted to it, as they will be rendered useless if the impervious clay is again thrown into them.

In coarse lands, where the ridges are generally very high and winding, the furrows between them, during a great part of the year, are

mostly full of stagnant water, which, in many instances, destroys the crop half way up the ridges, the declivity of the surface of the land being insufficient to carry away the water. In such cases, drains are required in almost every furrow, according to the breadth of the ridges. They must be made about twenty inches deep, and the breadth of a common garden spade, and filled up with small stones, or coarse gravel, to within four inches of the bottom of the furrow; and if the land is very tenacious, the remaining space must be filled with porous soil. This practice, however, can only be recommended on coarse and other land of a similar nature; for it is evident that water within the earth, or on the surface, seeks a level where the fall through the porous soil is greatest; therefore a drain made across the slope or declivity of a field, or any piece of land, will undoubtedly intercept more water than when it is carried straight up the bank or rising ground; this principle holds good in every case, whether the drain be made to receive surface or subterraneous water. Drains winding across the slope or declivity of a field, whatever their number or depth may be, their effect upon tenacious or impervious sub-strata will be much greater than if they were made straight up and down the slope; and when the soil is mixed with thin strata of fine sand, which is the case nine times out of ten, the effect will be increased in proportion, and, accordingly, a much less number will answer the purpose, the expense will be greatly lessened, and the land and occupier much more benefited in every respect. The great error in the many systems of draining land now brought forward, is their universal adoption of running the drains straight up and down the slope in the furrows, instead of carrying them across it, and also in the smallness of their dimensions, without paying the least attention to quality of the soil and sub-soil, and whether the wetness proceeds from surface or subterraneous water. It is quite impossible for drains that are only two or three inches wide at bottom, and filled only ten inches high with broken stones or gravel, or laid with tiles covered with the impervious clay that has been taken out of them, more especially if they are made straight up and down the declivity, can have the same effect of drying the land as when they are carried across the slope, and made of larger dimensions: neither can such drains be so durable, as they are much more apt to blow, owing to their small dimensions, when made up and down the slope, than when they are made the reverse way. This assertion is founded on facts and practical knowledge; and I am convinced that nine-tenths of the land that is attempted to be drained by furrow drains, would be much more effectually and permanently drained at half the expense, if proper means were employed. I have lately had many opportunities of seeing this verified; but one, in particular, drew my attention in a field near Glasgow, which had been furrow drained in the summer of 1832. I observed, in passing it in the following spring, that many of the drains were already blown. The soil is of a sandy nature, and the ground has considerable declivity to the south; which circumstances ought to have pointed out the necessity of deep drains, and having them carried across the slope, by which means a complete drainage would have been effected, and the permanency of the drains secured at a much less expense. Among many other instances of this kind which have come under my immediate observation, is a field of nine acres belonging to Lord Strathallan, in Perthshire, which was attempted to be drained some years ago. The soil and sub-soil were a somewhat

stiff tenacious clay, mixed with thin veins of fine sand. No less than three hundred and ninety-six roods of drains, averaging from two and a half, to three and a half feet deep, were run in straight lines up and down the slope, and filled promiscuously with stones, from the size of a man's hand to that of the largest ox's head. The first three or four years after they were made, the ground appeared tolerably dry, and produced a few midling crops; but, in very few years, the drains were choked and blown, and the land became much less productive than it was even in its natural state, on account of the blown drains having formed springs where the land was perfectly dry before the draining was attempted. The failure of this ill-judged and ill-executed drainage, obliged the proprietor, in the autumn of 1830, to lift the whole of the old drains, as stated by the factor in the annexed note,* and renew the operations, by running the drains across the declivity, whereby not only one hundred and fifty-three and a half roods of drains have been saved, but a perfect drainage of the field has been accomplished at less expense than the lifting of the original drains. Many other examples of the failures of drainages from the same cause might be adduced, but, from their similarity, I consider it unnecessary in this place. I have not, however, met with any case that has not been successful when the drains were carried across the slope and made of sufficient dimensions, and amongst numerous others with which I have been engaged, I shall only mention one, which not only realized every expectation that could have been formed of it, but also was drained at one-third of the expense it would have cost if it had been done by the system of furrow draining.

This case was at Cleland, in Lanarkshire, the property of North Dalrymple, Esq. The field is of considerable extent, having a general slope to the south, and the soil is of a tenacious nature, intermixed with veins of fine sand. The drains are made across the slope, at the distance of twenty yards from each other, averaging three feet deep, and the breadth at the bottom is twelve inches: they are filled with stones, broken to the size of coarse road metal, to within ten inches of the surface, and the remaining space with porous soil. The outlets are made winding through the lowest places, and intersecting

* "*Castle Strathallan, April 29th*, 1831.

"Sir,—The drains you lined off in November last are now executed, and the land appears completely dry. The expense of lifting the old drains, which were quite useless by being stopped and bursted was as follows:—

	£.	s.	d.
For lifting 396 Roods of old Drains, at 9d. per Rood,.....	14	17	0
For filling in the earth, at 1d. per Rood,.....	1	13	0
	£16	10	0
The expense of the new drains which you lined out were,.....			
For cutting 44 roods, five feet deep and coupled, at 1s. 3½d per rood.	2	16	10
For cutting 150 roods, four feet deep, at 1s. 0½d. per rood,.....	7	16	7
For cutting 48 roods, four feet deep and built, at 1s. 1d per rood,..	2	14	0
For cutting level for the said new Drains,.....	0	6	8
	£13	14	1

The field is all ploughed and sowed with oats.

I am, &c.

PETER THORNSON, *Factor*."

To Mr. G. Stephens.

the cross drains. These operations were finished in the spring of 1832, and have not only given satisfaction, but may be recommended as a complete specimen of shallow draining.

It is evident, from the above statements, that the practice of putting a drain in every furrow, without discrimination as to the circumstances of the ground, is often a misapplication of labour and loss of capital; indeed, in many instances, where it can with propriety be used, the end would be much better attained by the proper formation of ridges and furrows, combined with deep ploughing, so that no water can remain dead. I have often seen large tracts of clayey land intermixed with whitish travelled stones, lying in sub-soils perfectly impervious, effectually drained by means of trench ploughing, and keeping the furrows regularly deep from one end of the ridge to the other. If farmers occupying clayey soils would pay more attention to the formation of the ridges and furrows, and to keeping the open ditches and water *gaas*, or cross furrows, sufficiently deep, to clear the surface of all stagnant water in the hollow parts of the fields, there would be much less necessity for making drains for removing surface water. After the cause of the wetness has been discovered, and the most convenient place for discharging the water ascertained, the lines of the drains must be fixed, according to the principles already laid down, by means of pins, small pits or plough furrows. If the work is to be done immediately, pins or small pits will be sufficient marks to direct the workmen; but, in case of its being delayed any length of time, a furrow should be drawn with the plough in the line of each drain, which will shew itself two or three years; indeed, to prevent mistakes, from the marks being removed or trampled down by cattle, plough furrows are preferable to all other marks.

Open Drains.—In draining bogs or moss, where the drains do not reach the hard bottom, ditches are preferable to covered drains, for should stones be used when the bottom is very soft, they would sink, whereby the drains would become useless: indeed, in all situations where the ground will allow it, the principal drains should be open; and when they can become the division of fields, which, in many instances, is practicable, that should never be neglected. It would be unnecessary to give any particular directions for their depth or widenes, as that must depend on the quantity of water they are to convey, and on the nature of the soil and situation in which they are made: one rule, however, may be general, that the width at the bottom should be one third of that at the top, which gives a sufficient slope to the sides, and the fall or declivity should be such as the water may run off without stagnation. In very soft soils, a greater degree of slope on the sides may be necessary; and in all cases where it is meant to receive surface water only, none of the earth thrown out should remain upon the sides, but should be removed to the nearest hollows; for when this is not done, their use is in a great measure counteracted. The earth, when left on the sides, prevents the surface water from getting into the drain—its weight causes the sides to fall in—makes it more difficult to scour or clean it—and adds much to its disagreeable appearance in the middle of a field. In cases where the augur or wells are obliged to be resorted to in open drains, they should never be made in the bottom, but on one side, with the outlet eight or ten inches above, which will prevent surface or flood water depositing any sand or sediment in the bore-holes whereby they might be injured.

Shoulder Drains.—Any surface water or partial springs in moss and marshy grounds, on which the large drains have no effect, and where stones cannot be used on account of the softness of the soil, is most effectually removed by means of shoulder drains. The method of making them, is by digging a trench from fourteen to sixteen inches wide, the sides perpendicular to the depth of two or three feet, and then by taking out the last spit with a spade, the breadth of which is three inches at the bottom, and four or five feet at the upper part. A shoulder is left on each side, on which the sod that was first taken up is carefully laid with the grass side downwards, or if it is not strong enough, others must be cut in the vicinity, and the remaing space filed with the loose earth a few inches above the level of the surface of the adjacent ground. Drains of this description, when properly executed, and moles kept out of them, will operate for a great number of years.

Covered Drains.—In every instance where covered drains are used, their dimensions depend on the depth, the quantity of water they have to carry, and the kind of materials they are filled with. When the depth does not exceed five feet, two feet wide at top will be sufficient, but whenever it is more, the width should be increased four inches for every foot in depth, and the width at the bottom should be twenty inches, which will give a sufficient space to build a substantial conduit. When this is not attended to, and the bottom of the drain is made so narrow, that the stones of which the sides of the conduit are formed, are obliged to be set on their edges, and the covers laid on them in this insecure state, they, in many instances, fall down before the drain is half finished, causing it to burst in a very few years, and often forming springs in the driest part of the field.

In digging drains, there are several circumstances which, if attended to, will greatly facilitate the execution of the operations, such as having the stones laid down by the upper side of the lines of the drains before the work is commenced, to be ready in case the sides should slip or fall in, which often happens in mixed soils, as, when this precaution is not attended to, the expense is not only considerably increased, but the work is done in a less accurate manner. Particular care must also be taken that the bottom of the drains are made with a regular descent, so that the water runs from the one end to the other without standing dead; and where bore holes or wells are necessary, they must be made before the conduit is laid, in order that the sand may be removed which the water may throw up from the stratum below, and would otherwise be deposited in the bottom of the drain which would thereby be rendered useless. The dimensions of the conduit depends upon the quantity of water it has to carry; thus, in an outlet drain, it requires to be larger than in a cross drain, which has only the water collected in itself to discharge. In general cases, therefore, the conduit in an outlet should be made from nine to twelve inches square, and, in cross drains, from four to six inches square. When the bottom of the drain is very soft, it must be laid with flag stones, to prevent the materials from sinking; and the stones forming the side walls of the conduit must all be laid on their flat beds, and covered with strong covers well joined together and packed at their ends; the space above, in clayey soils, must be filled with stones, broken to the size of a man's clenched hand, to within twelve inches of the surface of the ground, which remaining space must be filled with porous earth. Before the earth is put into the drains, the stones must be covered with straw, rushes, or turf with

the green side downwards, to prevent the loose particles from subsiding into the crevices among the stones. In cases where all the water comes from bore-holes, or rises in the bottom of the drain, eighteen inches of small stones above the covers is sufficient; but when it comes from the sides of the drain, it is necessary to fill the drain above the covers with some kind of porous substances, six inches higher than where the water breaks out; the neglect of this precaution is the reason why so many drains have so little effect in drying land.

In making covered drains, particular attention must be paid that they are not carried into the outlet at right angles, as their ends should be turned down in the direction, the water is to run a short space before they join it, to prevent the water in the outlet depositing any sand or sludge in their mouths, which will be the case if this is not attended to; indeed, it often happens, on almost every estate, that the drains are stopped and rendered useless from this precaution being neglected. The mouths of the drains ought also to be well built and secured with iron gratings, to prevent vermin from getting into them; and it must be examined from time to time, to see that it is in proper repair, and the outlet kept a sufficient depth, so that the water coming from the drains may run away freely, otherwise it will remain stagnant in them to the great injury of the land. To obviate this, it is advisable that a person should be appointed on every estate, under the superintendence of the factor or land-steward, to go through every field that has been drained, at least once a year, to examine the mouths and outlets of all the drains, and make any necessary repairs as he proceeds. Such an arrangement, I am convinced, would be very beneficial, and is highly necessary, as I have often found drains completely stopped in a year or two after they were made, and the land beginning to be wet again from this cause alone. Managers of landed property ought to be very particular in this department of rural economy; indeed a clause ought to be inserted in every lease, binding both proprietor and tenant to keep the mouths and outlets of drains in proper order at their mutual expense.

Rumbling Drains.—These are well adapted for removing water from alternate beds of clay and sand ridges, and also water confined in porous soils with an impervious bottom, as well as for receiving surface water from clayey soils. Their depth, in the two former cases is generally about four feet, and in the latter from two to three feet, and twelve inches wide at the bottom; they are filled with stones, broken to the size of coarse road metal, to within ten or twelve inches of the surface of the ground, and, in clayey soils, the remaining space with porous earth. Wood is sometimes used in drains of this description instead of stones; but, as it is liable to decay soon, and the drains will consequently be destroyed, it cannot be recommended when stones, gravel, smithy danders, or even coarse sand can be procured. Indeed, whenever my opinion has been asked with regard to making drains with wood, my uniform answer has been against snch a practice, having had experience of so many instances in which wood had been employed, although stones might have been procured in the same field of the land, having to be drained again within a few years; and, consequently, I could not consider myself acting candidly towards my employers in advising it. An instance of this occurred at Wallhouse, Linlithgowshire, a few years ago, in which I was called on to make a plan to drain the ground immediately around the mansion-house, and having examined it, I have found that the whole had been drained

some years before, and the drains filled with thorns and other brush-wood, which had decayed, and the clay having fallen in, springs were formed in many places in the lines of all the drains. What surprised me was to find them laid off in such a manner that there was no occasion to allow any of the old lines; and having inquired who was the engineer, I was answered your late brother. Being, however, aware that he never recommended drains to be filled with wood, if stones could possibly be procured, and more especially that he would not have done so in draining pleasure ground, where, in most cases, no expense is spared to do the work in the most substantial manner. I suspected that the work had not been executed according to his plan, and, upon making further inquiry, I found that my suspicions were correct, his specification having directed them not only to be made with stones, but also to have been from two to three feet deeper, which was exactly what I caused to be done, whereby a complete drainage was obtained.

Tile Drains.—These are best calculaled for removing surface water, and are made just wide enough to let the tiles be put easily into them; they are, in most cases, about twenty inches deep, but tiles may be used at any depth, provided the drain is filled with broken stones, or other open materials, to nearly the surface of the ground. The tiles should always be well burnt, and laid on soles, as whenever this is neglected, which is too often the case where tile draining is now practised, their duration will unquestionably be very short, whereas hard burnt tiles will last for almost any length of time without mouldering down. The expediency of using tiles instead of stones, depends entirely on circumstances; for, if stones are to be found, whether by collecting on the surface or quarrying within the lands that are to be improved, or even if they can be procured within a mile of the operations, tiles should never be used. Stones are preferable to tiles in making drains in all kinds of soils, provided a sufficient quantity are used, but where only a few inches of broken stones are used in a drain, well burnt tiles laid on thick soles, and covered with turf of any other porous substance, would answer the purpose better; and in porous soils, when the water is found at or near the bottom of the drain, if six or eight inches of broken stones were used in packing and covering them, a more substantial drain would be formed. In clayey or mixed soils, where the water enters the drain at different depths, stones, gravel, or smithy danders, are the only materials that can be used with advantage; in any case, however, where the tiles are used, the space above them must be filled to the surface of the ground with some porous material, otherwise the drains will be useless, and the undertaking will prove a complete failure.

In the preceding pages, I have endeavored to set before the reader, in as plain a manner as the nature of the subject would allow, a short practical detail of the principles required to be applied in draining the different descriptions of land, in all its diversified variety of soils, strata, and inequalities of surface, and I hope it will, in some measure, convince landed proprietors and those engaged in agriculture, of the folly of supposing that any single rule can be applicable to every case without being modified to the particular circumstances to which it is to be applied.

To drain land effectually, and at the least expense, must surely be the desired object of those who engage in it; but how can they ever expect to attain this, if the work is executed without any consideration

of the cause from which the wetness proceeds, as is too often the practice in this country. Thus, when a field is injured by wetness, no matter from whence it comes, all that is thought necessary to dry it, is to make drains straight to the wettest place, and through the hollowest part of it, and if these have not the desired effect, others are added, and the work people are bound to make them a fixed depth, and, after cutting and carving in all directions, the land is partially dried, and, in some instances, completely, but at three times the expense it would have been if they had been properly directed. The person engaged in this arduous undertaking, believes himself a complete drainer, and tells his master that there is no occasion for employing a professional man to lay off the drains, for he can do it as well as any man, and at half the expense; the master believes him, and being glad he has such a clever person in his employment, gives him orders to commence operations, which are carried on for two or three years, when after having spent a considerable sum of money to little or no purpose, a professional man has to be sent for to investigate the cause of the bad success and provide a remedy, which has generally to be a complete renewal of the operations upon other principles. Besides the instance at Castle Strathallan, already mentioned, of land having to be drained anew, another case occurred in which I was employed near Lanark, where the person acting as land-steward having prevailed on the proprietor to let him drain two fields with a number of small drains, the result was, after spending considerable time and capital, the land still continued very wet. When I was called upon, I found that not only much deeper drains were necessary to remove the evil, but also considerable alterations were required in their directions, which being executed, has proved completely effective in drying the land.

A similar cause occurred at Dargill, in Perthshire, the property of Lord Willoughby de Eresby; the soil of the field is of a light nature, with a sub-soil composed of a mixture of gravel and clay, from four to seven feet deep, under which lies the stratum, composed of sand and gravel, which contained the water. The former tenant spent a great deal of money in attempting to drain it, but with no effect, as the drains were not deep enough to reach the cause of the wetness, on which account the field lay nearly waste for several years. His lordship being anxious to bring it into cultivation, I was desired to get it drained; and, accordingly, I found it necessary to deepen the outlet, and to have it covered, on account of its great depth: the conduit was made twelve inches wide, and two feet high, which not only gave the necessary fall for the drains in this field, but also for others connected with it. It was also necessary to make three new drains in this field, instead of the numerous small drains which were made by the former tenant, one four feet, one five feet, and the other seven feet deep, which completely answered the purpose, and made it nearly as valuable as any other part of the farm. I could point out many other such instances, but I consider that those already stated are sufficient to put it beyond doubt, that if any drainage is executed without due attention to the quality of the soil and the nature and inclination of the strata, a failure will most probably be the result. Accordingly, every precaution ought to be taken before any operations are commenced in an undertaking on which the whole success of every other branch of agriculture depends; and, therefore, every circumstance of the art must be weighed and strictly observed, otherwise landed proprietors will most assuredly be led into serious mistakes. To obviate this as far as lies in my power, I have

been induced to draw up this practical essay, with the view of its being the means of introducing a more perfect knowledge of the principles necessary to be applied in draining every kind of land; and which I have found, during thirty years practice, to be uniformly successful in every case where the plans and specification were strictly attended to. This will not, however, be the case if alterations are made, as is frequently done, with the plans of professional men, and which I have sometimes experienced myself, in the drains not being made either the depth, nor filled with the same quantity or quality of materials as prescribed; and even, in some instances, the lines of the drains have been altered, consequently the land has been imperfectly drained, whereby the system has come into disrepute, as not answering the soil, or on some other frivolous pretence.

Too much cannot be said in favour of draining, which, particularly when conducted on proper principles, must be beneficial to all parties concerned. Whatever, therefore, may be the defects of this essay, I hope it will call the attention of agriculturists to this system, as first practised by Elkington, and which has proved so useful, not only in our own country, but also in others, as will be seen by the Archbishop of Sweden to the Royal Agricultural Society at Orebro, which will be found in another part of this work; and I trust that what I have said will shew that it ought to be vindicated and encouraged by every one who has the welfare of agriculture at heart, until another shall be produced superior to it, which, assuredly, has not yet been done.

Cotton—its Introduction and Progress of its Culture, in the United States.

[FROM THE SOUTHERN PLANTER.]

[The following graphic and entertaining Article was omitted in the 7th volume of our Journal, as much from inadvertance as from the absence of our Predecessor,—and although many of the facts it contains have been previously laid before our readers, yet, as they are now embodied in such regular and historic order, by the highly valued writer, Thomas Spalding, Esq. they cannot fail to be interesting to all who have that thirst after information, which is alone the foundation upon which all improvements must be made in Agriculture and all other Sciences..]

Gossypium or Cotton, a genus of the polyandria order, belonging to the monodelphia class of plants, and in the natural method of ranking under the 37th order, Columnifera. The calyx is double, the exterior one tripid, the capsule quadrilocular, the seeds wrapt in cotton wool. There are four species, all of them natives of warm climates—1st. Herbaceum or common herbaceous cotton, has an herbaceous smooth stock, two feet high, branching upward, five lobed, smooth leaves, and yellow flowers from the end of the branches, succeeded by roundish capsules full of seeds and cotton. 2d. The Hirsutum or hairy American cotton, hath hairy stalks branching laterally two or three feet high, palmated three and five lobed hairy leaves, and yellow flowers succeeded by large oval pods furnished with seeds and cotton. 3d. The Barbadense or Barbadoes shrubby cotton, hath a shrubby stalk branching four or five feet high, three lobed smooth leaves gladulous underneath, and yellow flowers succeeded by oval pods containing seeds and cotton. 4th. The Arboreum or tree cotton, hath an upright woody perennial stalk branching six or eight feet high, palmated four or five lobed, smooth leaves, and yellow flowers succeeded by large pods filled with seeds and cotton.—Encyclopedia Britannia, vol. 8, p. 21.

The above extract will more satisfactorily give the classification or order in which the cotton plant stands in the vegetable world than I could do, and I have the more readily adopted it, because it distinctly embraces all the cottons that are extensively cultivated in

the United States, and little need be added except that the seeds of the first and second varieties, besides the cotton wool that covers them, have the seeds in whole in the second variety, and in part in the first, covered with a close short fur very analagous to the under fur of an animal; and in the United States all the cottons seem to have an increasing propensity to the production of the fur or down. It increases the difficulty of separating the wool from the seed, but has no other injurious effect. Whether this change is in obedience to some slow, moving, but irrestible law of nature, applying as well to the vegetable as to the animal world, or arises from the intermingling of the ferina of cottons of different varieties having in some districts been carelessly brought together, must be left to time and careful observation to determine.

The Sea-Island Cotton of Georgia, and of course of Carolina, is derived from the fourth and last variety of cottons in the above classification. It would be perennial if the climate would permit it, and is so when the lands are new, and the soils warm and favourable. I have known it in new and warm alluvial soils to survive for five years; and have often seen it vindicate its claim to its character of arboreum or tree cotton, in the height to which it grew, for I have measured plants that were eighteen feet high, and that put on the character rather of trees than shrubs. But when the cotton grows so large it yields no return to the cultivator. The winter finds it still covered with blossoms or unripe fruit, and a single night of freezing weather, which may be expected by the first of November, blights at once, as well the fruit as the flowers and stems.

When this fourth variety of cotton was first introduced, this was the case, and I do not remember, (for I remember the time well,) that a single pod rewarded the attempts in giving promise to the future. But the winter of 1785 and 1786 were fortunately mild, the cotton under experiment had generally been planted in new, and warm, and fruitful soils—frost rarely penetrates far into the earth in such situations in Georgia. The roots of the cotton had been sheltered and protected by the *earth* from the cold, and that life which had slumbered in the roots of the plants during winter, was awakened into activity in the spring. The cotton stalks which had been killed in the winter were cut down to the surface of the ground. The shoots that grew up from the roots of the previous year were earlier in their growth, did not rise so high, sooner blossomed, and sooner bore fruit. The second year the cotton bore and ripened its fruit, the seed was in some degree acclimated, and the first steps taken which were to end in a few years in making the United States emphatically the cotton country. This great revolution in the commerce and manufactures of nations was effected by a few thousand people, scattered through the two Southern States of the American Union, not cheered on upon their labours by the bounties of one nation or the diminished duties of another; but rather living and labouring under the law of the two great empires, who alternately sent increased duties and commercial restrictions, long embargoes, and war, and national tariffs, to oppress, and restrain, and control their labours—those labours which were to give to ten thousand ships their freight—to millions of men, women, and children labour and the bread which is brought, and to millions more a cheaper covering than they ever wore.

But we will proceed to the objects of your inquiry and leave bad and blundering statesmen to the wrath of him, who visits the sins of the fathers upon the children to the third and fourth generation.

The provinces from Virginia to Georgia had been planted by the mother country for her own purposes. The persons who had emigrated to these plantations had gone to them with the hope of repairing or improving their condition; neither laws or religion had driven them there. Their interests still united them, and these feelings bound them to their own, or to their fathers' ancient home. When therefore the war of the American Revolution overtook them, the abstractions which were to break to pieces a great nation, and which for the first time perhaps in modern ages, had originated with the rulers and not with the ruled. These abstractions divided the southern colonists as they had divided the people of England; and although none felt that it was right that the descendants of Anglo-Saxon men should be taxed without being represented in the Parliament that taxed them, yet many thought the distant evils that would result from this course was to be borne rather than the immediate evil of civil war and its many consequences. Friends were therefore alienated from each other, and families broken asunder in their tenderest relations—but when peace came and individuals found themselves scattered that were once near each other—earlier remembrances were recalled—messages and letters began to be interchanged, and the position in which the revolutionary war had severally left them became known to each other. England rather remembering the past than looking to the future, seemed to be desirous of placing faithful sentinels at the two extremes of the American Republic. She therefore from her many colonies, selected Nova Scotia and the Bahama Islands as the only colonies where a provision in land was to be made for the loyal men who had clung to her fortune through blood and in ruin. These provinces offered no inducement to the agriculturist at the time, but Providence more kind than government, was about to produce a great change in human affairs. Arkright had designed and perfected his spinning machine, between 1783 and 1785, and when the southern colonists were landed with their faithful slaves upon the rocks of the Bahama Islands, in looking round for something upon which they might employ themselves, the new interest which cotton had awakened, in consequence of Arkright's machinery, reached them. Probably the Board of Trade invited, and may have aided them upon this subject, but at least they obtained the best cotton seed that was any where to be found, to commence their labours with. There is a small island in the Caribbean sea called Anguilla, which had been long known to produce the best cotton of the West-Indies. The new settlers in the Bahama Islands procured cotton seed to commence the culture with Anguilla. They had in the year 1785 introduced the culture of cotton upon several of the Bahama Islands successfully, particularly upon Long Island and Exuma. The father of the writer of this paper, in the winter of 1785 received from Col. Kellsall, then a planter upon Exuma, a bag of cotton seed. Several other persons in Georgia received about the same time cotton seed from their old associates or friends. Wishing to be particular, the writer will state what he remembers: among the persons who did receive cotton seed was Josiah Tatnall of Savannah, from his father then Surveyor General of the Bahama Islands. From the cotton seed transmitted that winter in small parcels from the Bahama Islands, has grown up the sea island cotton of Georgia and South-Carolina. In the long and diligent cultivation of cotton for now almost forty years, many changes have been observed to have come over the cotton under the influence of soil and climate; but the writer can distinctly state that

the cotton he now grows is descended in direct line from the cotton seed received by his father from Col. Kellsall, and that every plant of sea island cotton in either Georgia or Carolina, is derived from the small parcels of cotton seed transmitted about that time from the Bahama Islands, and which was the seed known in the West Indies as the Anguilla cotton.

It was soon noticed by cotton growers that soil and situation had more than common influence, as well upon the quality as upon the quantity of cotton produced upon any given portion of land. Certain soils and situations retained in the cotton its original appearance, an intenseness of yellow in its blossom, a fruit full and sound, a seed quite black, and free from fur or down; while upon other soils and upon other situations the plant, the flower and fruit was putting on other appearances. The plants as if anxious to adjust themselves to a new temperature, took on a more coarse configuration of limbs and stem, a thicker branch, a rougher, larger and more scalloped leaf, a more cone like pod, a seed covered either in whole or at its points with the close down or fur that has already been described. At first the most careful cultivators were anxious by selection to keep the seed as much as possible resembling the seed first introduced; that is, black and free from down, and the more so as it was most easily separated from the cotton by the machines employed, and was considered most productive; but in process of time the varieties that stole up among the original stock was found to produce a finer and more uniform and longer wool. A current of selection has now therefore directed itself another way, and these hybrids, for I believe them to be so, although the germs of these changes may have lingered for ages in the original seed without developing themselves, have taken on three distinct appearances in seed; neither in blossom or plant differing to the eye from each other, although greatly differing from the parent stock, as being coarser and rougher in their form and leaf, with blossoms of a lighter yellow; having bolls larger and more cone like in their shape. The finer cottons of the sea islands are obtained from these three varieties of seeds: one with little or no down upon it, but with a long beak or point, to a seed longer than the original; a seed with down upon the two ends, but still with the pointed beak; and thirdly, a long seed with a sharp beak but completely covered with a soft close fine fur or down inseparably connected with the shell of the seed. These new varieties which produce the cotton now most in request are later in perfecting their fruit, and have consequently increased the uncertainty of the most uncertain and doubtful crop to which perhaps human care was ever directed.

But we will now proceed to describe the situation and soils. There is a long string of islands extending from Georgetown in South-Carolina to St. Marys in Georgia, that is, from 32° 30' to 30° north, a distance of about 200 miles. These islands were covered with live oak and other evergeens of a southern climate. They had been the abode of the reed men of the West, but rather when the natives were fishermen than hunters; and the vast accumulation of oyster, and clam, and other shells, mingled with the remains of the bones and pottery of their old inhabitants, fill every stranger with astonishment at the multitudes which their remains would bespeak, or the long time that must have been required to introduce such accumulated masses. These decaying shells seem to have intermingled with the original sandy soils of these islands, and digesting the vegetable matter that fell from

trees and other sources, formed with them a light and fertile loam. These islands at an earlier period of colonial story, had been employed in growing indigo. It was upon two of these islands, surrounded by the salt waters of the sea, and separated from the continent by several miles of grassy but salt meadows, that the cultivation of the sea island cotton commenced.

If Frederick the Great, never forgot him that introduced a better description of rye into Prussia, and if Swift is right in saying he merits a great name who will make two blades of grass grow where one had grown before, why should we deny to the dead what may be their due? The first cultivators of the sea island cotton in Georgia, were Josiah Tattnall, and Nicholas Turnbull, on Skideway island near Savannah; James Spalding and Alexander Bisset, upon St. Simon's Island at the mouth of the Alatamaha; and Richard Leake upon Jekyl Island adjacent to St. Simons. For many years after the introduction of the Anguilla cotton, it was confined to the warm highland of these islands, bathed by the saline atmosphere, and surrounded by the salt water of the sea. Gradually, however, the cotton culture was extended into lower grounds, and beyond the limits of the islands to the adjacent shores of the continent—into soils containing a mixture of clay, and lastly into coarse clays, deposited by the great rivers where they met the tides of the sea. In all these soils the cotton plant grows well. In all these soils fine cottons are produced. The only essential property that is required, is a saline atmosphere: with it any soil in Georgia or Carolina may produce fine cotton—without it no soil will produce fine cotton.

It is within this district of country, from Georgetown in South-Carolina to St. Marys in Georgia, and extending not more than fifteen miles from the sea, to which the sea island cotton is still confined. Whenever it has been carried either South or North, or West beyond these limits, a certain decline in quality has followed its removal. Many changes have taken place in the manner of cultivating the sea island cotton since the first introduction. When first introduced, the seed was deposited either in hills raised a little above the common surface at five feet distant each way, or in holes at the same distance apart, and the intermediate spaces were dug up, pulverized and kept free of grass or weeds by the hand, hoe, or by ploughing. But it was soon found that this distant planting, with a few seeds only, left a great portion of the field unoccupid by plants, and consequently unproductive; for as it has already been said, the cotton plant is one of the tenderest productions of vegetable life. The growers of cotton found it therefore necessary to increase the quantity of seed, to insure a sufficient number of plants, and to bring them nearer together. Fortunately for the cotton culture, Tull's book upon husbandry had been more read in the southern colonies than in England; and his ridge husbandry was adopted for sea island cotton, and is particularly adapted to it. I may say necessary to its successful culture.

The present process, (and it has been the same for twenty-five years past,) is to make up the field into ridges occupying five feet of space each, and extending in straight lines across the entire field. If the land is at all low or subject in any degree to water, these ridges are intersected at one hundred and five feet from each other by ditches which receive the water that may collect in the hollow spaces upon which the cotton plant is growing. These hollow spaces represent the water furrow in wheat cultivation, and serve the same purpose, that is, in

directing the redundant water that falls, into the drains that take it off the fields.

A field is well prepared to receive the cotton seed when drains intersect it at regular distances of one hundred and five feet; when the surface of the land is thrown up into ridges of five feet, rising about ten inches above the intervals, the crown of the ridge flat, broad and regular. A trench is then made along the middle of the ridge from two to four inches, dependent upon the time of planting, which extends from the first of March to the first of May. Upon this subject as upon all others in which men are concerned, wisdom is found between the extremes; and experienced growers of cotton generally prefer planting from the first to the fifteenth of April. When cotton is planted early in March, before the sun has warmed the soil to any great depth, it is necessary to deposite the seed in drills not more than two inches deep, or there will not be warmth enough to vegetate the seed. Later in the season when the power of the sun has increased, it is necessary, in seeking for that moisture which is as requisite for vegetation as heat itself, to sink deeper into the soil, and the drills which are then made to receive the cotton seed are required to be four inches deep. From the many accidents to which this feeble plant is subject in its first growth, experience has taught the Georgia cultivator that it is necessary to place many more seeds in the ground than can grow there; and it is usual therefore to sow at least one bushel of cotton seed to the English acre. The persons employed in planting the cotton are generally divided into gangs of three. One of these opens the drill along the top of the ridge; the most intelligent of them carefully drops the seed into the trench, while the third follows in his, or more often in *her* steps, and with a hand hoe returns the soil while yet moist into the trench from whence it was taken. For myself, I prefer performing this operation with the foot; it is less troublesome to the labourer than carrying and using the hoe. It keeps the mind intent upon one operation rather than two. Walking along erect, the feet are alternately employed to return the soil into the trench upon the cotton seed; and the whole weight of the person brought to bear upon the foot that has just performed the operation, presses the yielding and crumbling soil into close compact with the seed. This pressure of the foot after sowing, is like the roller in English husbandry, and is as beneficial to cotton as the roller is known to be to wheat or other grain. But after all this care, you are never sure that from your first sowing a sufficient number of plants will stand. One night's frost, which sometimes comes as late as April, will destroy the whole field, and drive you back upon your labours; one day of a strong, dry, north east wind will tear, blight, and destroy your whole field; and upon the best and richest soils, when both these evils are passed over, there is another ensuing, equally destructive. The cock chaffer or cut-worm is to be apprehended during all the month of April, and as the cotton comes through the ground and remains for several days, like the pea or other pulse, with but two radical leaves, every one of the plants that are cut by the worm, either above or below the ground, are destroyed; so that it is not unfrequent that whole fields have to be replanted in the month of May; about which time the worms pass into their winged state. At the close of the month of May, when apprehension from these accidents have passed away, a new labour begins. The numerous plants which crowd the ground, begin to injure each other and must be removed. Prudent persons divide their removal into three

operations, gradually adjusting the number to the increased growth of the plants, which are at length left in the drills, at from six inches to twenty-four inches apart from each other, depending upon the fertility of the soil and the expected growth of the plant, which rises in altitude, from three feet to eight feet high. And here it may be well to observe, that the cotton plant is a leguminous plant, (a green plant,) a plant that sends its roots down into the ground, and draws much of its nourishment, by its broad leaves, from the atmosphere. This increased distance in the drill, therefore, is rather to allow space for the plant to extend itself at its inclination, than from a desire to add nourishment to the roots, for at last the whole field should be shaded from the sun when the plants are fully grown, and the number should be adapted to that end.

But at every one of these *thinnings* as they are called, or drawing of the plants, the field is cleared with the hand hoe from all weeds and grass, and new soil brought up around the remaining plants to support them, now bending to every wind, from their tall but feeble structure. This course of thinning when it is necessary, and the weeding, and grassing, and drawing up, which is always necessary, continues until about the 20th July, by which time the operation has been repeated from three to six several times, dependent upon the soil and season. About the 20th July we may expect our summer rains should commence. These rains are not tropical, but they approach to tropical in their violence. Up to that time no climate can be more temperate than the climate of the sea coasts of Georgia and Carolina. Volney, from report, supposed it the best in the United States, and the writer of this paper believes it so. The atmosphere is elastic, the winds that blow every day from the sea are cool and refreshing; they bring health and healing upon their wings; they drive the vapours which have been gathered upon the waters, or that have arisen from the marshes which margin the shores, over the woods of the interior. But the time has now come when evil spirits should prevail. These vapours have been collecting dark and ponderous clouds upon our western hills; the equilibrium of our atmosphere is destroyed. Whether it is that the adjacent seas have become heated by the mass of warm water which the Gulf-stream brings along the coast, or that the same general cause which operates with such great power within the tropics, operates in part here, I know not. But from the 20th July to the 1st August, the winds change from southeast to southwest and bring down clouds charged with lightning and rain, in such masses as to deluge our fields. From the time this change takes place all labour in the cotton field should cease; for the plants, with broad, succulent leaves, and tall and slender stem, heavy naturally, in its growth, and feeble in its structure, can illy bear up against beating rains and strong rains, and requires all the support that the original ridge in which it was planted, and the repeated dressings up which have been directed, can give it. And hence arises the necessity of the ridge husbandry in the culture of the sea island cotton of Georgia and Carolina, and the importance of the repeated gathering or dressing up of the soil to the plants which has been described. The month of August is a month of doubt and anxiety with the cotton grower. Too much rain makes the plant cast off its fruit, its blossoms, and even its leaves. The full moon in the month of August too, is the time when the caterpillar is expected. This worm proceeds from a small brown butterfly, greatly resembling the the candle moth. This moth or butterfly deposites its eggs upon the

leaf of the cotton plant always a night or two before the full or change of the moon. They hatch in a few hours after they are deposited, then so small as scarcely to be visible to the naked eye. Like the silk worm, they appear to linger in their first stages, doing no great injury during their first nine or ten days; but in a few days, before they have completed their growth, they become voracious in the extreme, and like visitations of the locusts in the East, destroy whole fields in a few days. We have seen four hundred acres of cotton that looked promising and well to day, that four days afterwards had not a green leaf, and scarcely a small pod remaining upon it. These destructive visitations, judging from the past, may be expected once in about seven years. When cotton fields have escaped injury from rains, from wind, or worms, they offer as beautiful a spectacle to the observer, as the cultivation of any plant can presept. One wide and waving field of green leaves, covered from the first day of July to the first day of September with blossoms of three colours, and with a multitude of pods of every growth. The blossom, on the first of its coming out, is of a fine yellow colour, and it sustains that colour during the day. It changes under the influence of the night air to a crimson or red hue; and again on the third day it becomes of a rich chocolate brown, and falling to the ground, leaves a pod already of half an inch in diameter. The time which intervenes from the blossoming to the perfection of the fruit, greatly varies, depending upon the season. We have marked hundreds of blossoms which ripened and perfected their cotton in twenty-one days from the day of blossoming, and again we have frequently seen them require six weeks to arrive at the same end; which is however a bad omen, as to ultimate results.

The cotton pods begin to open about the first of August. From this time to the first of December the whole attention of the cultivator is directed to the picking in of the cotton as the pods daily open. During this autumnal season in Georgia and Carolina upon the sea-coast, the winds are violent and the rains heavy; so that the operation is tedious although not laborious; and during this time the persons employed may be expected to gather from the field 25 pounds per day, when the weather admits of gathering, or picking cotton, as it iscalled. When every thing is favourable, the persons employed should bring in 50 pounds daily of cotton in the seed; but, as the gathering is continued, so long as they bring in 10 pounds, twenty-five may be considered the full average of labour so directed. There are few subjects upon which there is more contrariety of opinion than upon the real amount of product given by the soil in any cultivation; agriculturist as I am, loving my profession as I do, seeking information to enlighten my labours as I have done, I know no book upon which I can lay my hand which would give me correctly the real mean result of labour or of land employed upon any one object throughout a whole extended district. The Abbe Raynal kindly tells how many coffee plants, and how many cotton plants, grew upon the French part of the island of St. Domingo; and yet there was not one planter in St. Domingo who could really have told how many cotton plants, or how many coffee plants, grew upon any one arpent of his own field. Taking, however, the best means my long experience would give, I should say that a labourer cultivates, in sea island cotton, four English acres, and that these four acres yield, as the result of his labour, 500 weight of clean cotton, or cotton separated from the seed, which consists of 400 weight of white cotton and 100 weight of coloured or stained cotton; and that these

500 pounds of clean cotton have, for the last fifteen years, averaged to the grower, 20 cents per pound for his white cotton, and 10 cents per pound for his stained cotton, yielding in American money, consequently 90 dollars to the labourer—a small remuneration, certainly, to the cultivator, and not calculated to excite jealousy or hostility in any other persons engaged in any other pursuit.

The "*Process for preparing Sea Island Cotton for market.*"—The process in preparing the cotton for market commences as soon as it is generally gathered in from the field and is tedious and troublesome in a high degree—the cotton when gathered from the plant, is put into a bag, containing about a half bushel, which hangs upon the person engaged in the operation, suspended from the neck or waist as they may prefer, and when it is desired by them they deposite the contents of the bag in a large light basket, which contains the amount of each one's gathering in the day. At the approach of night, the cotton gathered in the day is brought home and weighed and deposited in a common house, from whence the next morning, if the weather is good, it is carried out and spread upon drying floors, made of two inch American pine. These floors are of course proportioned to the quantity of cotton expected to be placed upon them at any one time, but may be estimated at twenty by forty feet of floor to every hundred acres of cotton cultivated; and in that ratio of quantities upon these floors. If it has been gathered from the fields in good weather, the cotton is allowed to remain but one day to take off the dew of the morning or the damp of the night air; but if gathered in wet weather, it may require two or even three days exposure upon the drying floors, which are raised upon posts three feet from the ground, as well to preserve the wood of which they are made, as to admit a more free circulation of air. It is however known that strong cold winds or very bright suns, if continued too long, have an injurious effect upon the fibre of the cotton; and this extreme exposure to either wind or rain is, therefore, carefully avoided, and the cotton left no longer upon the drying floors than is necessary to preserve it from heating in the house. Before it is put up finally in the house, it is usual and quite proper, to pass it through what is called a "Whipper" to shake off any sand or broken leaves, or any other extraneous matter that may have attached itself to the cotton, either in the field or in the gathering. The cotton having been gathered, dried upon the floors, and whipped, is ready for the next operation, or ginning.

The whipper, which is a very necessary instrument in the well preparing of cotton, is made of wood, is a long barrel, composed of slats, or reeds, (or it might be better made of wire,) six or eight feet in length, and two feet in diameter, with one end closed and the other open, and is supported at the two ends by feet of different lengths, so that the barrel in its horizontal position declines about one foot at the the lower end; a hopper containing about a bushel rests upon the upper side of the barrel, at the upper enclosed end of it. This hopper lets the cotton that is to be cleaned fall into the barrel, through which runs in its whole length, a shaft which is turned by the hand, by a crank attached to the shaft at the end. This shaft is intersected by rods, which reach to within an inch of the barrel. The cotton, as it falls from the hopper, is whirled round and round by these rods, until it escapes at the lower end of the barrel, by which time any sand or dirt, or leaves, or other matter, attached to the cotton, has escaped through the spaces intentionally left between the slats or reeds, which consti-

tute the external rim of this barrel or whipper. This whipping was formerly performed, as well upon the cotton in the seed, as after it was separated from the seed; but the second operation of the whipper has latterly been discontinued, under a belief that it produced a stringy appearance in the cotton wool.

The whipping of cotton at its first gathering and while attached to the seed, is really beneficial and should never be omitted. When these operations are completed, the harvest may be considered as closed, and the preparation of the cotton mart really begins. Many machines have been designed, and many forms of the same machine adopted, for separating the seed from the sea island cotton, but all of them at last resolve themselves into two wooden rollers turning by opposite movements upon each other. The rollers are from half an inch to an inch in diameter, and revolve from one hundred times to five hundred times in a minute. The whole resolving itself into this simple rule, that the smaller the rollers and the slower they revolve, the cleaner will be the cotton separated from the seed, because if the rollers are an inch in diameter, and above all if they revolve with a high velocity, they will take in soft seeds, small seeds, and false seeds or motes as they are called, and in crushing them in their passage through the rollers, will stain and injure the cotton in is appearance.

Much money has been spent upon costly machines, propelled by horses, by water or by wind, first in the Bahama Islands, and for many years in Georgia and Carolina, but at last most of the growers of sea island cotton have returned to their first and most simple machine, to wit, two wooden rollers kept together by a wooden frame, and a square shaft, upon which is fixed a wooden or iron fly-wheel, from two to three feet in diameter. The iron cranks which turn the rollers are connected with strips of wood with a treadle worked by the foot, this treadle runs under the machine, and is connected at the farther end of the floor of the house, by sockets within which it revolves: the man stands therefore in the front of the rollers, with a board between him and the rollers, upon which he holds a large handful of seed cotton, which he presents from time to time to the rollers, that are kept in motion by the presure of the foot upon the treadle,—this labour from habit becomes easy, as the feet is often changed in the operation. The task expected from the labourer with the machine, (which costs, when new and complete, ten American dollars,) is from twenty-five to thirty pounds per day. Women, from their careful attention, in keeping the rollers while they revolve upon each other, well supplied with seed cotton, were unquestionably the best ginners, as they are called, from the term gin, applied to the machine, but in process of time it began to be believed, that the continued motion of the feet produced a relaxed system in women, which was likely to lead in the end to abortion, or miscarriage; men have consequently been substituted for this work, one which being within doors and exercising both hands and feet without very much labour is preferred by them to any other in the winter. What is a little surprising, this simple machine, (the foot gin,) which we received from the West-Indies, is mentioned, if I mistake not, in the remains of "Nearchus's," voyage down the Hindus in Alexander's expedition, as gleaned and translated by Dr. Vincent, or Major Rennell in his map of Hindoston, as there employed for separating the seed from the wool, which, the Greek, for the first time, saw growing upon trees and shrubs. Could Asia Minor, could Greece and Egypt, have been acquainted with the cotton plant

up to that time? The inquiry is a little curious, nor is it uninteresting, but can better far be made, by one who lives surrounded by much of the wreck of past knowledge, by many of the memorials of past time, than by him who is living, in solitude, under the shadow of his oaks, on the shores of the Alatamaha. But we will return from our wandering, to the subject of your inquiries. To prepare the cotton for this ginning, or separation from the seed; when taken from the house where it was put, from the field, it is carefully looked over and separated, or sorted, as is called, the yellow cotton, the motes, and hard rotten, that may have passed through the whipper, is separated from the white; this is a work of care and attention and the future appearance of the cotton, much depends the manner in which this work is done. Women are employed in this operation, seated upon benches with tables before them; the seed cotton is spread in small parcels, taken out of one basket examined and turned over to another into which the person puts the entire of her day's labour. The quantity required to be thus examined and cleaned in the day by each one, is from sixty to one hundred pounds, according to the care bestowed upon the cotton, by the grower; after this sorting, it is exposed lightly and shortly to the sun, that it may take off any dampness the cotton may have acquired in the house; it is then passed from this drying immediately to the gin, or machine that separates the seed from the wool; after going through the gin and being separated from the seed, it is again turned over to the women who are generally in a large room, well lighted with glass windows. They sit with small tables before them, made, either with open slats, reeds, or wire, when any crushed seeds, any burnt, or blackened by the machine, any mote that has escaped the former searches are removed; and to have this work well done, thirty pouuds is all that is required per day from each woman. After this third operation it is considered ready to be bagged for market.

The bags in which sea island cotton is shipped are almost exclusively Scotch, are made of hemp, forty-two inchds wide, in the web, and should weigh one and a half pounds to the yard; these bags each require from four and one-quarter to four and one-half yards, and they are made to receive three hundred pounds of cotton. Two men are generally employed at a time in packing, and usually pack two bags in a day, in the manner following: The room into which the cotton has finally passed, after being prepared for the bag, is reserved expressly for that purpose, and is kept as clean in floor and walls as possible; adjoining to it is a small apartment under the same cover with a round hole made in the floor, just large enough to contain the bag when full of cotton, the open end of the empty bag is strongly sewed with twine, round a strong hoop, which, extending beyond the hole, suspends the bag vertically from it; one of the men then gets into the bag, with a heavey wooden or iron pestle, he presses the cotton gradually with his feet. and finally beats it down with the pestle, until the requisite quantity is pressed down into the bag. The bags were formerly made wet before they began to fill them, under the belief that it kept the cotton down in the bag, when pressed there, better than when dry, but this is an idle, and often an injurious practice, and should always be avoided.

We will now look back and collect the quantities of labour that is, or should be applied, to every bale of 300lbs. of sea island cotton, in preparing it for market. It requires 1000lbs. of seed cotton to pro-

produce 300lbs. of clean white cotton wool; fifteen persons will be required to sort and prepare 1000lbs. for the gin or machine; taking all weather, 25lbs. is the mean quantity received from gin per day; this gives 12 days labour to each bag for ginning; and 10 women mote these 300lbs. of cotton in the day, making, for sorting 15, for ginning 12, for moting 10, for packing 1, in all 38. But, besides these 38 that must be good and steady persons, there are usually two inferior persons, young or old, to place the cotton, which is about to be ginned, upon the drying floor, or to remove or pass it about it in any change of weather, thus requiring to every bag of sea island cotton well put up, the labour of 40 persons, one day. The bag costs for bagging, for twine and trouble in making, not less than 1 dollar and twenty-five cents, of American money—this, with 75 cents for freight, is to be subtracted from the value of the cotton, as there is never any return made for the bag by the purchaser.

The quantity of sea island cotton has not materially increased within these last ten years, nor is it likely that it will increase. The particular soils and climate that have heretofore produced it and to which it probably owes its quality, are confined to the limits first stated, that is from Georgetown in South-Carolina to St. Marys in Georgia. By looking at a map of the United States it will be seen that the long string of islands that bound our southern shore and separate the Atlantic Ocean from the Continent are at these points; but what is more, the tides that probably assisted to cast up these islands, have changed their climate. The tides along the shores of North-Carolina and Virginia, are much less than in Georgia, and they rise still less in Florida, and the Gulf of Mexico, that bounds the new acquired provinces of the American Union, to the south west.

Whether it is, that the cultivation of the sea island cotton, has afforded, fewer inducements than other subjects of cultivation; certain it is, the number of those engaged in it, even within these limited districts, have not greatly increased, and it is the successors, of the first cultivators, that are still engaged upon this object. They are generally an educated people, and a stationary one, less anxious after change than their countrymen are supposed to be, and although, severely smitten in war by England, and in peace by the National Tariff, they have still clung with some degree of fondness, to the places, whereat they were born, and to the seas, in which they were bred.

(The remainder relative to Upland Cotton, &c. will be concluded in our next.)

On Loosening and Pulverizing the Soil.

[FROM THE TALLAHASSEE ADVERTISER.]

THE great importance of deeply loosening the soil, may be seen from a consideration of the distance to which the roots of many vegetables extend themselves, when the soil is open to receive them. The earth, from its own gravity, settles down into a hard, compact and impenetrable body. While in this state, the roots of plants, which are the collectors of food, cannot find a free passage nor overcome the continual resistance.

The activity of the vegetable life may push them a little from the main stem; but they neither ramble at large nor draw the same copious

supply of nutriment. When we trace roots to the boundary of their range, we are struck both at the distance to which they travel, and at the obstacles which they surmount. Mr. Peters, President of Brokely and Marion Societies, states that a grain of wheat, if planted in a mellow soil, will strike its root three feet downwards, and elongate much farther horizontally.

The roots of oats have often been discovered at eighteen inches from the stem; and those of the turnip, which, with the exception of the bulb and tap-root issuing from it, are all slender, flexible threads have diverged on all sides to the distance of twenty inches. The doctrine may be illustrated in the garden as well as in the field, and in most cases in the former, with great effect; because there the cultivation is superior, and is carried to a greater depth.

The fibres proceeding from an onion, are of a whitish spongy substance, and are distinctly discernible in a black mold; and these have been found fully two feet in a trenched soil. The carrot will often measure from twelve to fourteen inches, and the fibres which feed it must have sunk much deeper. The potatoe will push out leaders to the distance of fifteen and eighteen inches in a sandy open loam, well stirred with a hoe.

These facts lead irresistibly to the conclusion, that the skilful cultivator should prepare the soil for the roots, and employ such instruments as will pierce it deeply and crumble it to powder, for the free and unrestrained passage of the radical fibre. If the ground be ploughed only three inches deep, the roots can descend no farther than the share and coulter have gone before them; and if a tangled sod of grass be *merely turned* over, and without being broken and pulverized, they will find vast difficulty in stretching themselves through this matted net-work.

The same observations will apply, if the surface be encumbered with unsubdued and unbroken clods. The roots will be unable to penetrate their hard coats, and however full of vegetable nourishment, it must be lost because inaccessible to these dispersed feeders of the crop. The fitness therefore, of every instrument to loosen the soil, becomes a criterion in judging of its merits; and its perfection is exactly in proportion to the superiority of its structure for accomplishing this essential end.

On Selection of Seeds.

[FROM THE FARMER AND MECHANIC.]

KIND Providence having placed me in a situation of life, which obliged me to procure a living by industry, and that principally in the agricultural line; it has caused me to be a strict observer of nature, with respect to such parts of the vegetable creation as have come under my particular notice; and I have been greatly embarrassed at the opinion very generally entertained by farmers and gardeners, that changing seeds, roots and plants, to distant places, or different soils, or climates, is beneficial to agriculture; such opinion not agreeing with my observations or practice. This induced me to make many experiments on that head, all of which, in more than forty years practice, have operated to prove to my satisfaction, that the above opinion is not well founded; and if so, must be extremely prejudicial, as it turns the attention of the husbandman from what appears to me, one great object, viz.: that of selecting seeds and roots for planting or sowing.

from such vegetables as come to the greatest perfection, in the soil which he cultivates.

What induced me to make experiments on the subject, was, my observing that all kinds of vegetables were continually varying in their growth, quality, production, and time of maturing. This led me to believe that the great author of nature has so constructed that wonderful machine, if I may be allowed the expression, as to incline every kind of soil and climate to naturalize all kinds of vegetables, that it will produce, at any rate; the better to suit them, if agriculturists will do their part in selecting the most proper seed. In support of this position, I will subjoin a few facts and experiments, out of a great number, which have all combined to prove the above to my satisfaction.

In or about the year 1746, my father procured the seeds of a long warty squash, which have been kept on the farm ever since, without changing, and are now far preferable to what they were at first. Our early peas were procured from London, the spring before Braddock's defeat, (1756) and have been planted successively, every season since on the place. They have not been changed, and are now preferable to what they were when first obtained. The seed of our asparagus was procured from New-York, in the year 1753, and since that time, I have not planted a seed beside what grew on my beds; and by selecting the seed from the largest stalks, I have improved it greatly.

A complaint is very general, that potatoes of every kind degenerate, at which I am not surprised, when the most proper means to produce that effect, is constantly practised; to wit, using or selling the best, and planting the refuse; by which means, almost the whole of these planted are the produce of plants the most degenerated. This consideration induced me to try an opposite method. Having often observed that some plants or vines produced potatoes, larger, better shaped, and in greater abundance than others, without any apparent reason, except the operation of nature, it induced me to save a quantity from such only, for planting the ensuing season; and I was highly gratified in finding their production exceed that of others, of the same kind planted at the same time, and with every equal advantage, beyond my expectation, in size, shape and quantity. By continuing the practice, I am satisfied that I have been fully compensated for all additional trouble.

A circumstance happened respecting potatoes, which may be worth relating: a woman whom I met in market, requested me to bring half a bushel of sweet potatoes for seed, the next market day, which I promised to do, but going through the market on that day, previous to her son's coming for the potatoes, I observed the woman selling such as I had brought for her; when the boy came, I asked him the reason they wanted potatoes for seed, while they were selling their own; his answer was, that his father said, if they did not get seed from me once in three or four years, their potatoes would be good for nothing. Query, if he had used the same means in selecting his potatoes for planting, as I did, whether he would have profited by changing with one, who used the other method?

In discoursing with a friend who lived at a great distance from me, on the subject, he mentioned a fact in favor of changing seed. Some radish seed which he had from me, produced radishes preferable to any thing of the kind ever seen in that neighborhood, which was near one hundred miles distant: but in two or three years, the radishes degenerated so as to be no better than he had used before; I asked his method of saving his seed; he said he had no other radishes in his

garden, and when they had pulled what was fit for use, let the others go to seed. I then told him my method, viz.: As soon as the radishes are fit for use, I dig up ten or twelve of those which please me best, as to colour, shape, &c. and plant them at least one hundred yards from where any others bloom, at the time they do: this I informed him, was the best method I knew of to improve any kind of vegetables, varying the process agreeably to their nature. I asked him, if he thought I should be benefited by exchanging with him? His answer was, he believed I was the best gardener.

In or about the year 1776, a friend sent me a few grains of a small kind of Indian corn, the grains of which were not much larger than goose shot. He informed me by a note that they were originally from Guinea, and produced from eight to ten ears on a stalk. Those grains I planted, and found the product not to answer the description; but the ears were small and but few of them ripened, before frost. I saved some of the largest and earliest, and planted them between rows of the larger, and earlier kinds of corn, which produced a mixture to advantage; then I saved seeds from stalks that produced the greatest ears, and first ripe, which I planted the ensuing season, and was not a little gratified to find its production preferable, both in quantity and quality, to that of any corn I had ever planted. This kind of corn I have continued to plant ever since, selecting that designed for seed, in the manner I would wish others to try, viz.; When the first ears are ripe enough for seed, gather a sufficient quantity for early corn, or for replanting; and at the time you wish your corn to ripen generally, gather a sufficient quantity for planting the next year, having particular care to take it from stalks that are large at bottom, of a regular taper, not over tall, the ears set below, and containing the greatest number of good sizeable ears of the best quality; let it dry speedily, and from this corn, plant your main crop, and if any hills should miss, replant from that first gathered, which will cause the crop to ripen more regularly than is common; this is a great benefit.

The above method I have practised many years, and am satisfied it has increased the quantity and improved the quality of my crops, beyond the expectation of any person who had not tried the experiment. The distance of planting corn, and the number of grains in a hill, are matters many differ in; perhaps different soils may require a difference in both these respects; but in every kind of soil I have tried, I find that planting the rows six feet asunder each way, as nearly at right angles as may be, and leaving not more than four stalks in a hill, produces the best crop. The common method of saving seed corn, by taking the ears from the crib heap, is attended with two disadvantages; one is, the taking the largest ears, which have generally grown, but one on a stalk. This lessens the production; the other is, taking ears that have ripened at different times, which causes the production to do the same.

A striking instance of plants being naturalized, happened by Col. Matleck sending some watermelon seed from Georgia, which he informed me by letter, were of a superior quality; knowing that seeds from vegetables, which had grown in more southern climates, required a longer summer than what grew here, I gave them the most favorable situation, and used glasses to bring them forward, yet very few ripened to perfection; but finding them to be as excellent in quality as described, I saved seed from those first ripe: and by continuing that

practice four or five years, they became as early water melons as I ever had.

Many admit the importance of a change of seed, from the fact of foreign flax in Ireland; but when it is considered that it is the bark of the stalk only that is used in Ireland, and that this is in the best perfection before the seed ripens, the argument fails when applied to other vegetables.

For many years past, I have renewed the whole seed of my winter grain, from a single plant which I have observed to be more productive and of better quality than the rest; a practice, which I am satisfied, has been of great use; and I am fully of opinion, that all kinds of garden vegetables may be improved by the foregoing methods, particular care being taken, that different kinds of the same species of vegetables are not in bloom at the same time, near together, as by this bad practice, they mix and degenerate.

I am sensible the foregoing will meet with great opposition and contradiction, but as an experiment is safe and easy, I hope it will induce persons of more leisure, ability, and observation than myself, to make trial, as a means of improving the agriculture of our country. Such is the sincere wish of thy friend,

JOSEPH COOPER.

On removing Fruit Trees.

[FROM THE GENESEE FARMER.]

THIS is a subject, which in gardening operations, requires more attention than it usually receives, for generally in the removal or transplantation of tress, both gardeners and nurserymen are too careless and inattentive in taking them up, not giving that attention to the preservation of the roots entire, which is of the utmost moment to the future health of the tree; considering that if they have left enough to keep the tree alive, it is all that is requisite. This is a very erroneous idea, and cannot be too much repudiated; for the consequence is, that although the branches left on remain alive, there is so great a deficiency of sap, from the loss of the roots, that the vessels cannot receive that portion of nutrition which they require.

'Tis too frequently the case, that the roots are broken off at random, or cut without having any just principles in view. In diminishing the roots of a tree in this manner, the result will be stinted and unhealthy trees, and frequently their death, is inevitable. A tree should be taken up with great care, preserving as many of the roots as possible; but in whatever proportion they may unavoidably be diminished, reduce the top of the tree to the same extent, as near as possible. This will enable the tree to grow with vigour, as there will be no more branches than the roots are competent to supply with food.

Another point in planting of trees is worthy of a remark—how frequently do we observe trees, when about to be planted, that their roots extend much farther than the pit formed for receiving them, and instead of enlarging the pit, the roots are either cut off, or what is still worse, turned back and distorted. This is very censurable. Every hole intended for the reception of a tree, should be at least two or three inches wider, in all directions, than the roots of the tree will extend, when planted. Yours, A GARDENER.

Grafting and Setting out Fruit Trees.

[FROM THE NORTHERN FARMER.]

Very early last spring, on a warm rainy day, I went to a neighboring nursery, and gave a dollar for my choice of twenty of its finest apples trees. I was careful to cut off all damaged roots, and a part of the top; then in fine soil, on the same day, I set out these trees, taking great care not to cramp in the least degree the fibrous roots; excavating for some of them, a hole seven or eight feet broad, (the trees were not more than one and a half inch in diameter) digging deep, and putting compost and the best soil at the bottom. Thus they remained, until grafting time in May, when I pruned, and grafted as high as the size would admit, from five to eight feet; taking care to leave one or two small branches to perform the functions of elaborating the sap, till the scions should become sufficiently grown for that purpose. This was altogether an experiment with me; thus far it has succeeded well. Every wound healed; and every tree has now a firm and healthy young top—the scions grew from one to two feet last summer; and some of them grew over the old stock. Eight or ten of them blossomed, and some produced apples, though none of them came to maturity. I prefer to have the end bud on the scion.

If any of your readers or correspondents can suggest through the Northern Farmer, any improvements on my mode of setting and grafting, some other brother farmer may get a valuable hint, and I obtain encouragement to try the pear the following spring. Indulge me to throw out one hint, to those who intend to graft next spring. Sweet apples are said to be worth double to sour, and equally valuable with potatoes, for fattening hogs or cattle. It is important therefore, to select your scions from the richest varieties of the sweet apple, if your object be to raise apples for your live stock.

With all due respect, JACOB REDDINGTON.

Goshen, Jan. 28, 1834.

Use of Tanner's Bark in cultivating the Strawberry.

[FROM THE NEW-YORK FARMER.]

Mr. Editor,—I have a word to communicate upon the culture of the Garden Strawberry, that most delicious production of earth. I do not speak of the *kind*, or the *quality* of this fruit, but of the *method* to be adopted in cultivating any kind of it, in any soil. It is well known to all who have cultivated the strawberry, that much pains are requisite to keep a strawberry bed clear from grasses, and the too rapid increase of roots and runners, which hinders the fruitfulness of the parent stock. Indeed, such persevering attention is required during the summer months, to clip the runners or tendrils of the strawberry, to prevent their covering the whole ground, that were it not for the deliciousness of the fruit, and the convenience of having it at hand for so long a portion of the season, I should have relinquished the culture of it.

But while I was preparing my strawberry bed the last spring, and was speaking to a friend who had visited me from a distance, of the labour that was requisite to cultivate the strawberry with success, he said to me, "I have seen in one instance, in my part of the country,

the expedient of applying tanner's bark, such as is used for banking houses for the winter, to the strawberry bed, filling the space between the hills to the depth of three or four inches." I asked him the utility of that. He said "it possessed the two-fold advantage of preventing the growth of grass between the hills, and the fibres of the tendrils from striking into the ground, and becoming roots to new stocks, whilst it did in no sense prevent the growth and fruitfulness of the hills." This appeared so rational, that I at once applied the bark, and found it to succeed beyond my expectation. I had no occasion to hoe my strawberry bed through the season. If a grass appeared through the tan, I could remove the tan with my fingers, and extract the weed from the roots, and replace the tan; and if a runner shot forth its fibres into the tan; and they became roots, it only required to raise the runner with the finger, and it would quit the bark the whole length of the tendril, with the greatest readiness, because there was not soil enough in the bark to fasten the roots, and the bark being coarse and dry, it would fall from the fibres as soon as the runner was raised. My strawberries did as well as others this season, with one half or one third the labour they formerly required, and I thought the tan prevented the too powerful action of the sun upon the roots of the strawberry, while the reflection of the sun from the surface of the bark tended to mature the fruit. There is another advantage derived from the tan: it prevents the strawberries from becoming covered with dirt, as they ordinarily are, during showers and heavy rains; and the tan, instead of detracting from the beauty of the garden, actually contributes to it. The green hills of the strawberry, rising up through the red tan in regular order, have something of the appearance of verdant islands, rising out of a placid ocean. I apprehend, likewise, that the tan will prove a defence to the roots against the freezing and thawing of winter, but I have not had experience in this. In the spring, when the bed is to be cultivated in the usual manner, we have only to scrape the tan aside, and replace it as soon as the bed is made. I should select tan that had been drenched by the snows and rains of one winter, lest there might be too much astringency in the bark directly from the vat of the tanner. I am, very respectfully, yours,

October 24, 1834. H. H.

Water in Farm Yards.

[FROM THE GENESEE FARMER.]

THE author of Husbandry in Scotland, is of opinion that when cattle are fed in winter on dry food, as hay or straw, no expense should be spared in supplying them with a sufficient quantity of water. It has been ascertained, that a bullock feeding upon straw, having water at command, will drink of it eight times a day; hence it is evident that he cannot get enough, if only driven twice a day to an adjoining stream or pond. It is therefore advisable, where it can be done, to bring water into a cistern in the fold-yard, to which the cattle may go whenever they are in want of it. The cistern may be made of rough masonry, and consequently would not be expensive. There can be no doubt that cattle would improve much more rapidly, more especially on coarse fare, when thus supplied with water, than if they were only occasionally driven to it.

On the Culture of Florida Coffee.

[The following communication, giving an account of this article, and the mode of cultivating it, is of great importance to our Agriculturists in opening to them an additional field of culture, to the great staple commodities of the South, whereby the wealth of our State may be augmented. The South is indebted for her wealth, to the great products of her soil, each of which appears to have been introduced by accidental circumstances, and renders it remarkable, that Carolina is not indebted to any indigenous production, for any portion of her prosperity. By the introduction of the culture of Florida Coffee, another staple may be added to those, with which the South is blessed—indeed, if the production were only adequate to one half of the consumption of Coffee in the United States, it would be an object of immense importance. There are 80,000,000 lbs. of Coffee consumed in the United States, which may be estimated at an average price of 14 cents per lb., making $11,200,000. If but one half the price of West-India Coffee could be obtained for that of Florida, and but half of the latter consumed, there would be an increase to the South in her produce, equal to $2,800,000, and a gain to the country in the consumption, to the same amount. It will be recollected, also, that with the exception of a little timber and rice none of the Southern productions are exchanged for those of the West-Indies. It becomes our Planters, to commence planting this crop without delay, and note such peculiarities in its cultivation, as would have a tendency to improve it—particularly the soil, situation, manner, harvesting, and such other matters as would readily suggest themselves to the intelligent planter. Thus, by comparing the various methods, the true mode of cultivation in this climate may be ascertained.—*Ed. So. Ag.*]

To the Editor of the Florida Herald.

Mr. Editor—I have brought under cultivation a species of Coffee, which grows wild in Cuba, and has found its way to the City of St. Augustine, supposed to have been brought there many years since by the Spanish people. It is completely naturalized to our climate, and will grow in any of the cotton growing States. I recommend the cultivation of it particularly to the Planters, as another staple of immense value, which will realize more than any other staple of our country now under cultivation, even if we obtain not more than half the price of West-India Coffee. It is made use of in the interior of Cuba, by the inhabitants, as Coffee. It also grows wild on the banks of the Mississippi, around New-Orleans, where it is collected by the French people, and made use of as Coffee.

I have made use of it in my family for three months, and find it superior to the Green Cuba Coffee. It improves from age, being equal to the best of Coffee in three months after it is collected. Those who are peculiarly fond of the taste of the Green Cuba Coffee, can obtain it by mixing at the rate of one pound of the Green Cuba Coffee, with four pounds of Florida Coffee.

It is an annual plant, and must be cultivated in the same manner as Cotton, leaving the plants at a greater distance, as it grows most luxuriantly from ten to twelve feet high on good land. It will grow on the poorest land which has been exhausted from cultivation, and will

produce a good crop. Plant it at the same time that Cotton is planted, on beds five feet apart. On good land, plant your seeds five feet apart, dropping ten or twelve seeds; cover it lightly; when the plants are sufficiently grown, thin them out, leaving a single plant at the distance of five feet: poor lands may be planted nearer; two pounds of seeds will plant an acre of land; one acre will produce from fifteen hundred to two thousand pounds of Coffee. It blooms from early in July until late in October; ripens from early in August until frost, or early in November; the seeds are about the size of a grain of wheat, of an olive colour, each pod containing from forty to sixty grains of Coffee. The pods must be collected as fast as they ripen, and when threshed, which is performed with a common stick from the woods, it must be done in a close room with a tight floor, and after it is winnowed, it is then fit for use. Neither horses, cattle or hogs, will eat of the plant; it is not disturbed by caterpillars or any insects; it returns more foliage to the land than any highland cultivation; is also a great acquisition to the rearing of Bees, as pure honey rises on the stem of each stalk of the leaves, which is sought after by the bees and ants.

The Editor of the Southern Agriculturist, and all Editors in the Cotton growing States, will please insert the above for the public benefit. I am yours respectfully, &c.

ABRAHAM DUPONT.

Matanzas, East Florida, Nov. 25th, 1834.

Seeds may be obtained by applying to Messrs. J. & C. Lawton, Charleston, S. C. and of Col. Francis Gue, of St. Augustine, E. F.

PART III.

MISCELLANEOUS INTELLIGENCE.

[*Gray Sulphur Spring of Virginia.*—It is known to most of our readers, that Mr. Legare (the late Editor of this Journal) purchased in 1833, one of the Mineral Springs of Virginia, which at that time was not known to the public, and of course neither improved nor resorted to by visiters. It will no doubt be gratifying to them to learn the success which has attended his undertaking, and we have selected the following extract from "*Letters of a Traveller in Virginia*," published in the United States' Gazette, Philadelphia.]

"At 10, A. M. on the 10th September, we left the Red Sulphur Spring in a private carriage, to pay a visit to the Gray Sulphur, situated at the distance of nine miles in a south-west direction, just within the border of Giles County.

"This is a new establishment, grown up by magic since the first of June last. It belongs to John D. Legare, Esq. of South-Carolina, a gentleman of established literary talent, who, by his great enterprize and good taste, has made this lovely wilderness blossom like the rose,

and bring forth the fruits of civilization and comfort. There is a comfortable new brick house standing near the middle of a gentle sloping plain of about twenty acres, nearly clear of trees, and entirely surrounded by forest-covered mountains, between whose base and the house are several beautiful conical hills, rendering the view from the portico exceedingly pleasing. Every thing here is conducted after the polished and agreeable manner of South-Carolina; all is redolent of the Palmetto, and a little pleasant circle from that state, may generally be found here.

"There are two Springs under the same cover, within ten feet of each other; one containing *inter alia*, Bicarbonate of soda, which is an excellent anti-dyspeptic, and is well taken an hour after dinner, which is always so good here, that every body eats too much. The other contains some sulphuretted hydrogen and several neutral salts, rendering it aperient and diuretic. It should be taken an hour before breakfast. The breakfasts and suppers are capital, furnished forth with various cakes, in form and colour new to the northern eye, of rice, of corn and wheat; and in discussing these interesting subjects, a quiet deliberation reigns, affording the epicure the double opportunity of curing hunger and gratifying taste. The wine is so good, that he who drinks it, falsifies the old adage, that "omnes errorem bibunt," there is no mistake about it. The road from the Red Sulphur, to this "ultima Thule" novissimaque of the Virginia Springs, is good, but so hilly, that it requires three hours to overcome its nine miles. The little plain is skirted on one side by a rivulet, which flows close at the base of Chimney Ridge, a spur of Peter's mountain, and washes a very thick stratum of limestone, consisting almost entirely of casts of several genera of marine shells. We passed here two pleasant days, enjoying the quiet of the wilderness, combined with every comfort brought from the busy haunts of men, and then retraced our steps by the same vehicle to the Red Sulphur. On a fine day, the ride is delightful, the road passing for eight miles through the heart of the virgin forest, yet untouched, save by the hand that traced the road."

[Mr. Legare has promised to give us a more particular account of his Spring, and also of the Virginia Springs in general. —*Ed. So. Ag.*]

Animal Cotton.—In Baudry's second voyage to Louisiana, he describes the *Manioc or Indigo Worm*, "as being attacked at one period of the year, by swarms of the *Ichneumon fly*, who deposit their eggs in every part of the body of the former, which now becomes a hot bed for hatching them; the insects produced, all at once immediately spin each a very minute white cod, which envelopes it. The *Manioc* is now covered with a white pod, which is with considerable difficulty shaken off; in a few days, the insects in it are formed into flies, and leave the animal cotton behind them. It is produced in abundance in this way, and is considered superior to vegetable cotton."

A Preparation for writing on Zinc, intended to be used in labelling Plants, has lately been brought into use in Europe. The *Horticultural Register*, for August last, introduces it to our notice, by stating that it was discovered by Mr. Symon, an amateur at Brussels, and has been experimented on by M. Henry Braconnot, the celebrated Chemist of Nantz, who recommends it, as being perfectly durable when exposed to the weather. The following is the preparation:

Take Verdigris in powder, one part; Sal Ammoniac powder, one part; Lamp-black, half a part; Water, ten parts. Mix them in a glass or pot mortar, at first only adding as much water as will mix it well, then add the remainder of the water. When placed in a vessel, let it be well shaken up from time to time, and in a few days it will be fit for use. This is not only excellent for labelling plants, but also for marking objects it is wished to preserve, in low, wet situations, becoming quickly dry, and being very durable.

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Melons.—A French periodical gives the following method of hastening the ripening of melons. Spread on the melon, and round it, a thick couch of from one to two inches of pounded charcoal. Lampadius tried this plan at Friebuler, in 1813, and succeeded in making melons ripen in a box of earth in the open air, during the summer of that year, in the mining district of Saxony. The surface of the earth thus covered with charcoal, had at noonday a temperature of 37.50 to 47.50 of Reaumur, while at the same time the thermometer in the shade was only at from 15 to 20, and in the sun at 25 to 37.50.

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Bene Plant.—A writer in the *Farmer and Gardener*, says:—I feel confident the *Bene* plant would flourish and thrive wherever the okra and tomato are now raised,—with this difference, that the *Bene* thrives and grows best on a poor sandy soil, not quite strong enough for the okra. From the *Bene* seed the purest oil in the world is expressed. It is acknowled by all foreign and domestic epicures, to whom opportunities have been afforded to try it, that it is superior to the finest olive oil, for *all* the purposes to which that foreign oil is applied; and superior in another important particular, it never becomes rancid—like Madeira, the older it is, the better. Mr. Milledge, a former Governor of Georgia, sent a bottle of the *Bene* oil to Mr. Jefferson, or some other high functionary of Government, who unhesitatingly pronounced it superior, in *all* its qualities, to the olive. We only want a proper machine in Georgia to express oil from the diminutive *Bene* seed, to supersede, in the course of a few years, the use of every other oil for domestic purposes. A visit from, with the 'cute' observation of, a citizen "away down East," would soon "find out the way," not only to enrich himself with a patent, but to receive the thanks and plaudits of the whole south.

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Honey Bees—important suggestion.—A respectable farmer of this neighborhood, called on us, a few days since, for the purpose of inviting us to give publicity to a practice adopted by him for preserving Bees through the winter, which he considers as one of great utility and importance to farmers, who produce their own honey. Our informant states, that he has kept Bees for a number of years, and after pursuing several expedients for the preservation of his Bees through the cold weather, he last fall placed his hives upon a suitable bench in his cellar, which was perfectly dry, and from which all light was excluded. Upon bringing the hives again into the open air, a few days ago, the Bees exhibited an unusual degree of healthiness and activity, and there were but a very small number of dead ones in any of the hives. This experiment is, in our informant's opinion, a very successful one, and well worthy the attention of those farmers who engage in this branch of rural economy. It is at least deserving of a repetition.—*West Chester Herald.*